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ICDF Complex Waste Acceptance Criteria

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ABSTRACT

The Staging, Storage, Sizing, and Treatment Facility (SSSTF) will accept Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) wastes generated within the boundaries of the Idaho National Engineering and Environmental Laboratory (INEEL). Hazardous, mixed, low-level, and Toxic Substances Control Act (polychlorinatedbyphenyls and asbestos) wastes will be accepted for receipt, storage, staging, sizing, and treatment or repackaging at the SSSTF. The purpose of this Waste Acceptance Criteria (WAC) document is to provide the basis for the types and quantities of wastes allowable for receipt, staging, storage, and sizing at the INEEL CERCLA Disposal Facility (ICDF) Complex, and to set the criteria for waste to be treated at the treatment unit. The ICDF landfill and evaporation pond WACs establish criteria for disposal at those two units within the ICDF Complex.

Implementation of this WAC will ensure compliance with the Final Record of Decision for the Idaho Nuclear Technology and Engineering Center Operable Unit 3-13. Once waste has been received, it must meet the WAC for the specific disposal/treatment unit (on-Site or Off-Site) for which it is destined.

Compliance with the applicable regulatory and technical requirements as implemented by ICDF Complex WAC will ensure protection of human health and the environment, including the Snake River Plain Aquifer.

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FIGURES

TABLES

ACRONYMS

ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
DOT	Department of Transportation
DQO	data quality objective
EDF	Engineering Design File
EPA	Environmental Protection Agency
ER	environmental restoration
FFA/CO	Federal Facility Agreement and Consent Order
FGE	fissile gram equivalent
HASP	Health and Safety Plan
HEPA	high-efficiency particulate air (HEPA)
HI	hazard index
HOC	halogenated organic compounds
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality

IDW	investigation-derivedwaste
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LDR	land disposal restriction
MCL	maximum contaminant level
MSDS	Material Safety Data Sheet
NA	not applicable
NRC	Nuclear Regulatory Commission
O&M	operations and maintenance
OSHA	Occupational Safety and Health Act
OU	operable unit
PCB	polychlorinated biphenyl
PPE	personal protective equipment
QA/QC	quality assurance/quality control
RA	remedial action
RBC	risk-based criteria
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RD	remedial design
RD/RA	remedial design/remedial action
RI/FS	remedial investigatiodfeasibility study
ROD	Record of Decision
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex
SSSTF	Staging, Storage, Sizing, and Treatment Facility
TAN	Test Area North

TCLP	toxicity characteristic leaching procedure
TOC	total organic compounds
TRA	Test Reactor Area
TRU	transuranic
TSCA	Toxic Substances Control Act
WAC	Waste Acceptance Criteria
WAG	waste area group
WMP	Waste Management Plan
WTS	Waste Tracking System

NOMENCLATURE

The following definitions are presented as an aid to the reader for the understanding of technical and scientific terms used within this document.

Analytical residue and sample preservative residue: Aqueous and organic solutions from sample preservatives and analytical residue generated from field preparation and laboratory analyses.

CERCLA-derived remediation and removal wastes: Wastes from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities that may include, but are not limited to, soil, water, contaminated personal protective equipment, filters, and other support equipment that cannot be decontaminated.

Certification: Statement from WAG manager or designee that confirms that the waste on the shipment matches the waste on the profile.

Compressible void space: Space that is compressible through the application of load or settlement over time (e.g., interstitial space in soils, empty space in wooden boxes of soils).

Construction wastes: Wastes generated during the on-Site construction of environmental remedial action activities.

Contaminated equipment: Contaminated equipment becomes a waste stream if it cannot be properly decontaminated or reused.

Debris: Solid material exceeding a 60-millimeter (mm) particle size that is a manufactured object, plant or animal matter, or natural geologic material intended for disposal. However, the following materials are not considered to be debris:

- Any material for which a specific treatment standard is provided in Subpart D of 40 CFR 268, such as lead acid batteries, cadmium batteries, and radioactive lead solids
- Process residuals, such as smelter slag and residues from the treatment of waste, wastewater, sludge, or air emission residues
- Intact containers of hazardous waste that retain at least 75% of their original volume.

A mixture of debris and other material that has not been treated to the standards provided by 40 CFR 268.45 is subject to regulation as debris, if the mixture is composed primarily of debris, by volume, based on visual inspection.

Drill cuttings: Cuttings generated from well installation activities. Perched water and Snake River Plain Aquifer water well installation is expected to generate a substantial volume of drill cuttings.

Facility: An area within the boundaries of a Department of Energy (DOE) -controlled site that is access-controlled to prevent public access, for example, the Test Reactor Area (TRA), the Idaho Nuclear Technology and Engineering Center (INTEC), and Test Area North (TAN).

Fissile: Any material fissionable by thermal (slow) neutrons. The three primary fissile materials are uranium-233, uranium-235, and plutonium-239.

Free liquids: Liquids that can readily separate from the solid portion of a waste under ambient temperature and pressure (DOE O 435.1), as demonstrated by "Environmental Protection Agency Paint Filter Liquids Test Method 909" (EPA 1986).

Hazardous debris: Debris that contains a hazardous waste listed in Subpart D of 40 CFR 261, or that exhibits a characteristic of hazardous waste identified in Subpart C of 40 CFR 261.

Hazard index: The sum of more than one hazard quotient where the Environmental Protection Agency (EPA) goal is a value not to exceed 1.

Hazard quotient: The ratio of a single substance exposure level, over a given time period, to a reference exposure level at which no adverse effects are likely to occur.

Hazardous substance: Any material designated as such pursuant to CERCLA, including all Resource Conservation and Recovery Act (RCRA) hazardous wastes, radionuclides, a variety of other chemical substances, and any material identified as a hazardous substance, such as petroleum, petroleum products, and all hazardous wastes.

Hazardous waste: Waste designated as hazardous by EPA regulations (40 CFR 261.3) and regulated under RCRA.

High-level waste: Highly radioactive waste material. High-level waste results from the reprocessing of spent nuclear fuel, including the liquid waste produced directly during reprocessing. As per Department of Energy (DOE) Order 435.1, the term refers to any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and to other highly radioactive material that is determined, consistent with existing law, to require permanent isolation. (Adapted from: Nuclear Waste Policy Act of 1982, as amended.) (42 USC 10101 et seq.)

Hydraulic spills: Unintentional releases of hydraulic fluid. Spills that occur when hydraulic fluid leaks from equipment seals or through ruptured hoses.

Incompressible void space: Percent of voids in waste that is encased in a cement enclosure (e.g., void space within a container that has been filled with concrete).

Investigation-derived waste: Materials that are generated from CERCLA investigations, such as drill cuttings, purge water, development water, overburden, interstitial and underburden soils, and wastes (debris, sludge, etc.).

Infectious waste: Waste containing living organisms that could endanger human health or the health of domestic animals or wildlife by extending the range of biological pests, viruses, pathogenic microorganisms, or other agents capable of infesting, infecting, or extensively and permanently altering the normal populations of organisms.

Low-level radioactive waste: Waste that cannot be defined as high-level radioactive waste, spent nuclear fuel, transuranic (TRU) waste, by-product material [as defined in Section 11e (2) of the Atomic Energy Act of 1954, as amended] (42 USC 2011, et seq.), or naturally occurring radioactive material (DOE Order 435.1).

Miscellaneous waste: Nonrecyclable, unwanted material, such as trash, labels, rags, and other debris

Mixed waste: Waste containing both radioactive components as defined by the Atomic Energy Act of 1954 (as amended) and hazardous components as defined by 40 CFR 262.

Nonaqueous wastes: Include soils, debris, contaminated equipment, investigation-derived waste (IDW), drill cuttings, personnel protective equipment (PPE), unused and unaltered sample material, analytical residue and sample preservative residue, sample containers, miscellaneous solid waste (trash, labels, rags, etc.), solid secondary waste, and construction waste.

Personal protective equipment: Items worn or used during waste-handling activities such as coveralls, shoe covers, boots, gloves, glove liners, hoods, and duct tape. Coveralls and hoods are generally made of paper or Tyvek. Gloves are generally latex or nitrile, and glove liners are made of disposable cloth material. Shoe covers and boots are generally rubber.

Purge/development water: Water generated from well development or during sampling that is removed from a well before samples are collected.

Radioactive waste: Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954 (as amended), which is of negligible economic value considering costs of recovery.

Sample containers: Vessels composed of steel, aluminum, Teflon, brass, or plastic used to contain samples of water, soil, or other media. Once used, these containers become a waste stream if they cannot be decontaminated for reuse.

Secondary waste: A generic category of wastes that are generated from support activities (including operation and maintenance [O&M] activities) related to retrieving, processing, and packaging the investigation-derived materials. Examples of secondary wastes include waste associated with routine decontamination activities (excluding facility closure), personal protective equipment, administrative area and support services wastes, used equipment and filters, and other similar wastes generated during O&M activities.

Solidification: A technique that limits the solubility and mobility of hazardous waste constituents through physical means. This process changes the physical state from liquid or semi-solid to a solid.

Soil waste: Soils excavated as part of a project that may be contaminated as a result of spill and pipeline leaks or radioactive liquids from plant liquid transfer operations, or soils that exceed risk-based criteria.

Spent nuclear fuel: Fuel that has been withdrawn from a nuclear reactor following irradiation and that has not yet been reprocessed to remove its constituent elements.

Stabilization: A technique that limits the solubility and mobility of hazardous waste constituents by causing the constituents to bond or chemically react with the stabilizing material.

Structural stability: A waste form that will generally maintain its physical dimensions and its form under the expected disposal conditions, such as weight of overburden and compaction equipment, the presence of moisture and microbial activity, and internal factors such as radiation effects and chemical changes. The waste form itself can provide structural stability by processing the waste to a stable form or by placing the waste in a disposal container or structure that provides stability after disposal.

Toxic Substances Control Act (TSCA) waste: Waste managed strictly under TSCA regulations (15 USC 2601 et seq.). Presently, only PCBs and asbestos are regulated by EPA (40 CFR 761 and 763) as TSCA waste.

Transuranic waste: Per DOE Order 435.1, radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the administrator of EPA, does not need the degree of isolation required by the 40 CFR 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR 61. (Source: Waste Isolation Pilot Plant Land Withdrawal Act of 1992, as amended.)

Unused and unaltered sample material: Material that may include excess soil cores from the interbeds, underlying basalt, and groundwater.

Verification: The process to determine that data are true and accurate by the generating WAG against the physical, chemical, and radiological limits of the WAC. The ICDF Complex validation of the waste receipt and profile acceptance.

Waste Stream: A waste or group of wastes generated from the same process or facility with similar physical, chemical, or radiological properties with the same disposition pathway.

ICDF Complex Waste Acceptance Criteria

1. INTRODUCTION

The U.S. Department of Energy Idaho Operations Office (DOE-ID) authorized a remedial desigdremedial action (RD/RA) for the Idaho Nuclear Technology and Engineering Center (INTEC) in accordance with the Waste Area Group (WAG) 3, Operable Unit (OU) 3-13 Record of Decision (ROD) (DOE-ID 1999a). The OU 3-13 ROD requires the removal and on-Site disposal of some of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation wastes generated within the boundaries of the Idaho National Engineering and Environmental Laboratory (INEEL).

The INEEL CERCLA Disposal Facility (ICDF) Complex will be an on-Site, engineered facility, located south of INTEC and adjacent to the existing percolation ponds. Designed and authorized to accept not only WAG 3 wastes, but also wastes from other INEEL CERCLA actions, the ICDF Complex will include the necessary subsystems and support facilities to provide a complete waste management system.

The major components of the ICDF Complex include

- The disposal cells (landfill)
- An evaporation pond, consisting of two cells
- The Staging, Storage, Sizing, and Treatment Facility (SSSTF).

The ICDF Complex, including a buffer zone, will cover approximately 40 acres, with a landfill disposal capacity of approximately 510,000 yd^3. The ICDF landfill meets the substantive requirements of Resource Conservation and Recovery Act (RCRA) Subtitle C, Idaho Hazardous Waste Management Act (HWMA), DOE O 435.1, and Toxic Substances Control Act (TSCA) (15 USC 2601 et seq.) polychlorinated biphenyl (PCB) landfill design and construction requirements. The landfill is the consolidation point for CERCLA-generated wastes within the INEEL boundaries. The landfill will be able to receive CERCLA-generated wastes outside WAG 3 that meet the land disposal restriction (LDR) requirements (DOE-ID 2001). Waste generated within the WAG 3 area of contamination (AOC) that has not triggered placement is not required to meet LDR criteria.

The evaporation pond, designated as a RCRA Corrective Action Management Unit (CAMU) in the OU 3-13 ROD, will be the disposal site for ICDF leachate and other aqueous wastes generated as a result of operating the ICDF Complex. Other aqueous wastes such as existing Group 4 and Group 5 purge water may be disposed in the evaporation pond in accordance with the ICDF evaporation pond Waste Acceptance Criteria (WAC). In addition, other aqueous wastes as specified in Table 2-1 of the Evaporation Pond WAC (DOE-ID 2002a) may also be accepted.

The SSSTF is designed to provide the centralized receiving, inspection, treatment, and segregation areas necessary to stage and store incoming waste from INEEL CERCLA activities. These wastes, as well as wastes generated during the operation of the ICDF Complex, will be disposed in the ICDF landfill or the evaporation pond or shipped off-Site. All SSSTF activities shall take place within the WAG 3 AOC to allow flexibility in managing the consolidation and remediation of wastes without triggering LDRs and other RCRA requirements, in accordance with the OU 3-13 ROD. LDRs will apply to waste generated outside the WAG 3 AOC or to those WAG 3 AOC wastes that have triggered placement.

Figure 1-1 illustrates the WAG 3 AOC. Figure 1-2 illustrates the relationship of the ICDF Complex to the INTEC facility.

The Staging and Storage Annex (SSA), to be incorporated as part of the ICDF Complex, once the ICDF Complex RA Work Plan goes final, is already located within the INTEC fenced area and serves as a temporary staging and storage area for INEEL CERCLA waste. The waste in the SSA will be designated for

- Direct disposal to the ICDF landfill
- Direct disposal in the evaporation pond
- Staging, storage, or treatment in the SSSTF
- Packaging in preparation for off-Site disposal
- Other INEEL on-Site disposal
- Off-Site disposal.

Wastes from WAG 3 and other CERCLA actions within the INEEL boundaries will be stored at the SSA during the design and construction of the ICDF Complex. Following construction, the operation of the SSA will be in accordance with the ICDF Complex RA Work Plan. The SSSTF will accept only low-level, mixed low-level, hazardous, and TSCA remediation wastes for disposal. Current projections of Site-wide CERCLA waste volumes total about 5 10,000 yd^3. Most of the waste will be contaminated soil, but debris and CERCLA investigation-derived waste (IDW) are also included in the waste inventory.

This document details the criteria that must be satisfied prior to acceptance of waste for staging, storage, sizing, treatment, and/or disposal. Compliance with the ICDF Complex WAC will ensure protection of human health and the environment, including the Snake River Plain Aquifer (SRPA), and will ensure compliance with applicable regulatory and ROD requirements. Wastes that cannot be disposed of in the ICDF landfill or evaporation pond may be stored, treated, and/or repackaged for off-Site disposal.

1.1 Purpose and Objectives

The purpose of this WAC document is to provide the basis of CERCLA-generated wastes to be accepted for receipt, staging, storage, sizing, treatment, repackaging, or disposal at the ICDF Complex. The objectives of the ICDF Complex WAC are to ensure the following:

- Waste placed within the ICDF Complex will not exceed the allowable limits for the protection of the SRPA per the OU 3-13 ROD requirements.
- The commitments in the OU 3-13 ROD are met and maintained
- The waste received at the ICDF Complex contains only the radionuclides and hazardous constituents that the facility can safely manage.
- The concentrations and/or total activities of the waste received at the ICDF Complex are compatible with the SSSTF design and operations.

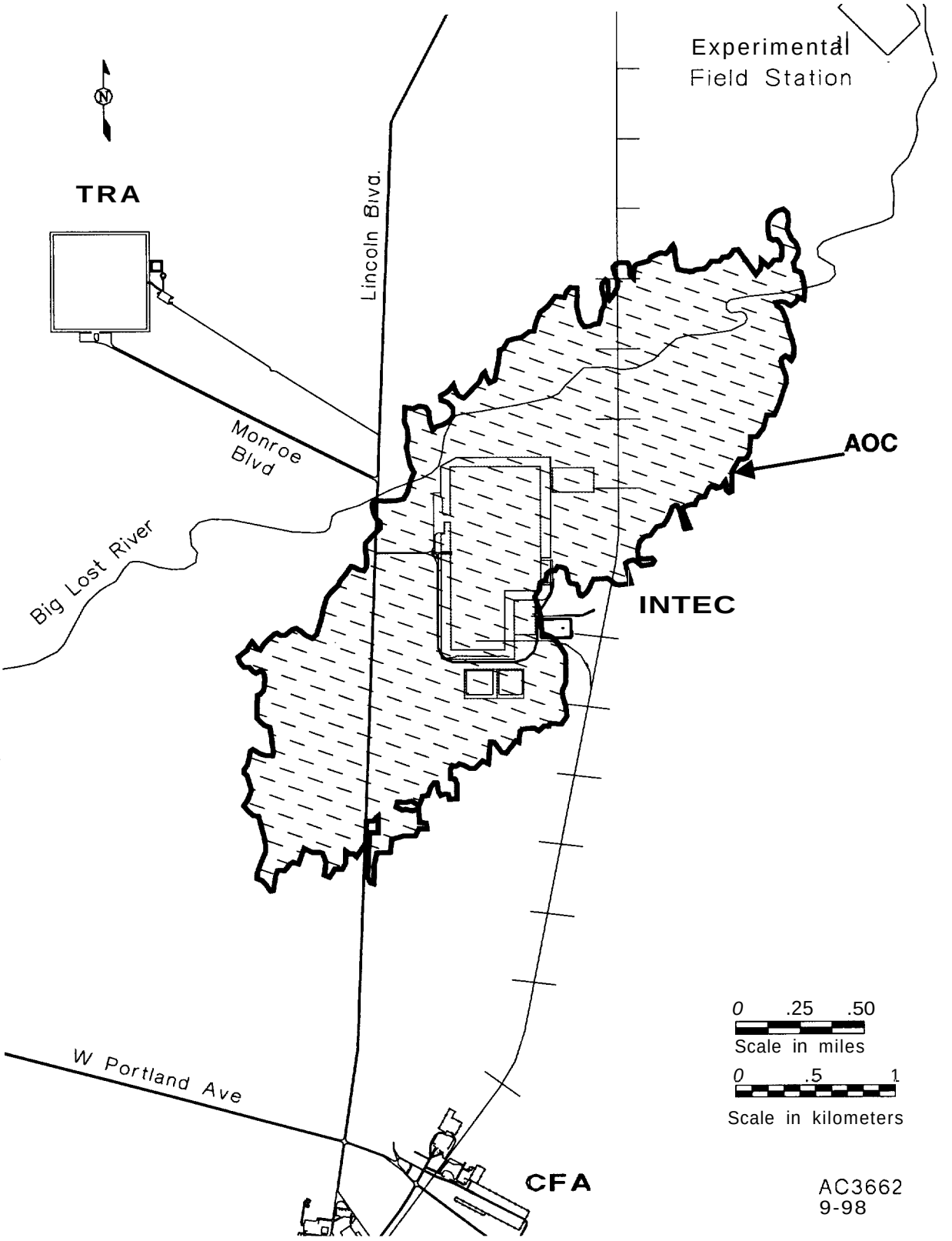


Figure 1-1. **WAG** 3 area **of** contamination.

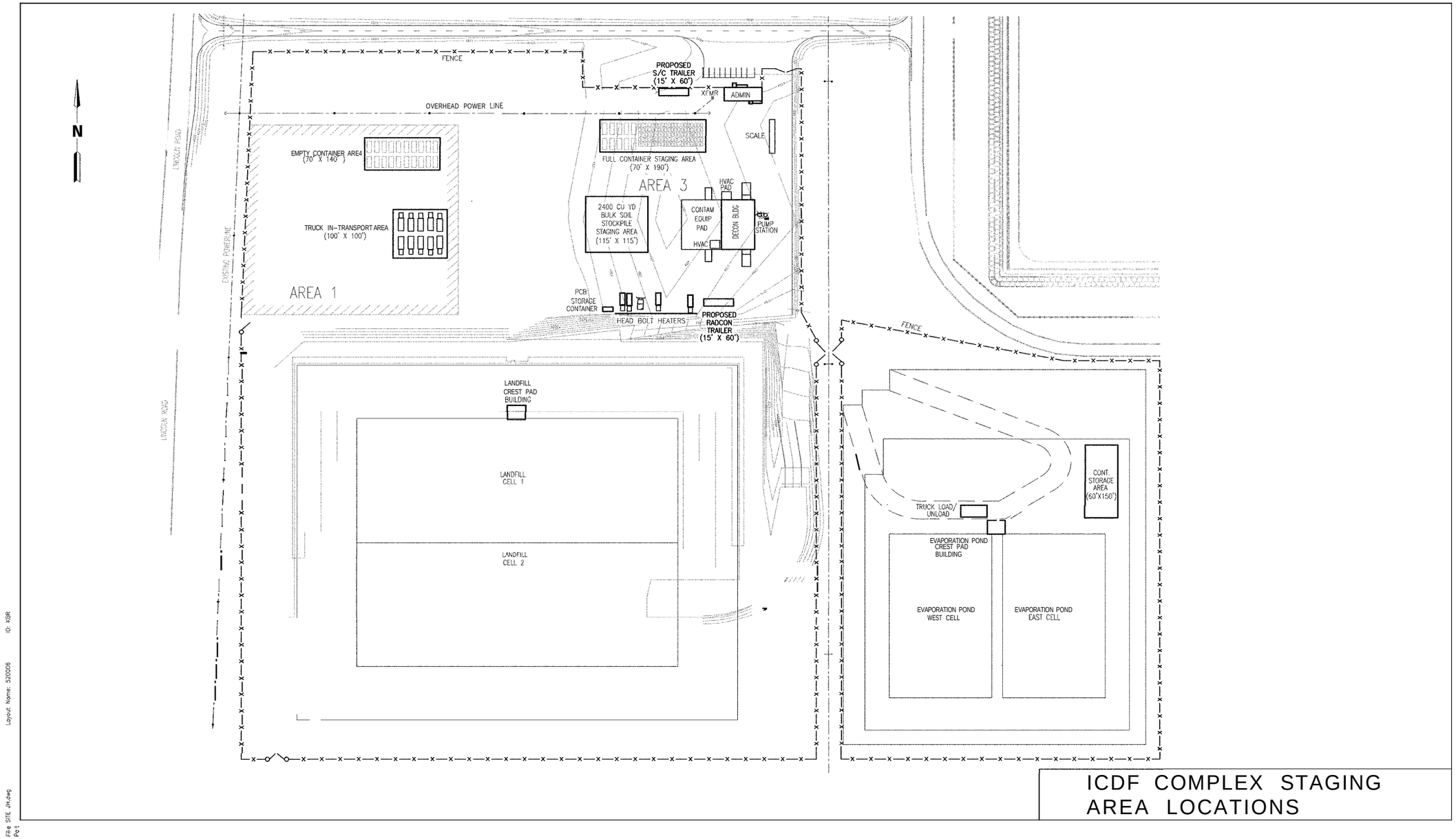


Figure 1-2. ICDF Complex in relation to INTEC.

- Waste received for treatment at the SSSTF can be treated and disposed at the ICDF Complex.
- The waste received at the ICDF Complex is in a form or container that will maintain its integrity and retain acceptable configuration under the conditions expected to be encountered during ICDF Complex operations and closure.
- Waste received at the ICDF Complex does not contain materials that will compromise the safety or integrity of the facility under the expected operating conditions.

1.2 Scope

The ICDF Complex, including the SSSTF, is designed to DOE Order 435.1, RCRA Subtitle C minimum technology requirements, and the applicable or relevant and appropriate requirements (ARARs) as outlined in the OU 3-13 ROD. The ICDF Complex is authorized to accept wastes generated from CERCLA removal/remedial and investigative activities within the INEEL boundaries.

1.3 Roadmap to ICDF Complex WAC

The following are primary elements of the ICDF Complex waste acceptance requirements:

- Responsibilities (Section 1.5)
- Criteria basis (Section 4.1)
- Waste Acceptance Criteria for the ICDF Complex (Section 5)
- Waste content or concentration accepted at the SSSTF for the ICDF Complex (Section 5)
- Waste form and container requirements for the ICDF Complex (Section 5)
- Exceptions to WAC requirements (Section 2.2.1)
- Prohibitions (Section 5.2)
- Waste Acceptance Criteria for the treatment unit (Section 6)
- Waste content or concentration accepted at the treatment unit (Section 6)
- Waste form and container requirements for the treatment unit (Section 6).

1.4 Relationship to Other Documents

This ICDF Complex WAC is based on and integrated with several related documents, as discussed in the remainder of this section.

1.4.1 OU 3-13 Record of Decision

The OU 3-13 ROD (DOE-ID 1999a) is the regulatory authorization for the ICDF Complex. This document includes the regulatory basis for the SSSTF and the ARARs that the ICDF Complex must meet. The OU 3-13 ROD also describes the AOC for WAG 3. Because the ICDF Complex will receive waste

from both inside and outside of the WAG 3 AOC, this WAC has different requirements for mixed waste from inside and outside of the WAG 3 AOC. These AOC issues are addressed in more detail in the Waste Acceptance Basis (Section 4).

1.4.2 ICDF Complex Waste Management Plan

The ICDF Complex has an operational waste management plan (WMP) that details how those wastes generated during the operation of the Complex will be handled. The CERCLA-generated wastes to be processed through the ICDF Complex are from the generating sites addressed in the ICDF Complex O&M plan.

1.4.3 Related ICDF Complex WACs

Three integrated WACs actively govern the requirements of the acceptance and disposal process These WACs are briefly described below:

1. ICDF Complex WAC—This WAC specifies the requirements for waste to be accepted into the ICDF Complex. Included within this WAC are also the requirements for receiving, storage, staging, and/or sizing. This WAC also sets the criteria for waste to be treated at the treatment unit.

2. ICDF landfill WAC—This WAC specifies the requirements for waste to be disposed in the ICDF landfill (DOE-ID 2003a).

3. ICDF evaporation pond WAC—This WAC specifies the requirements for waste to be treated in the ICDF evaporation ponds.

Integration between the various WACs will be achieved, in part, through the use of the same waste profile by all facilities. The Waste Profile form, an example of which is provided in Appendix A, will help provide consistent documentation of the waste during shipment, staging, storage, sizing, treatment or transfer, and/or final waste disposition.

Management of waste associated with operations of the SSSTF, or generated as a result of operations of the SSSTF (i.e., decontamination water, stabilization debris, etc.), is described in the ICDF Complex O&M Plan.

1.5 Responsibilities

The INEEL organizations operating and using the ICDF Complex are responsible for performing activities in accordance with this document. A system of checks and balances is in place to ensure the appropriate level of coordination between ICDF Complex personnel, and the various users. A series of interface points are designed to communicate waste receipt schedules, waste quantity and form, characterization information, waste certification, treatment requirements, packaging, transportation, documentation, receipt, and disposal. A description of the process is presented in Section 3. The remainder of this section identifies specific responsibilities of the ICDF Complex management and operations team and ICDF Complex users with respect to waste acceptance and disposal.

1.5.1 ICDF Complex Management and Operations Team

The ICDF Complex management and operations team includes ICDF personnel and subcontractors assigned to operate the facility and to receive, stage, store, size, treat, and/or transport waste. A brief description of each is outlined below:

ICDF Complex Facility Manager – This position is responsible for the ownership of the facility. Duties include ensuring appropriate interface agreements are developed, defining specific areas of responsibility, ensuring personnel assigned are trained and qualified for their job assignments, and ensuring that INEEL policies are followed.

Operations Manager – This position will be responsible for the daily operation of the ICDF Complex. This includes being the point of contact and notification for the waste generating site to begin acceptance process, reviewing and approving or rejecting all Waste Profiles, determining the disposition of the waste upon entry into the Complex, and oversight of the day-to-day operations of the Complex.

Waste Tracking Specialist/Database Administration – This position will be responsible for (a) scheduling the receipt of the waste into the facility; (b) entering all data into the database to maintain inventory and complete waste tracking process; (c) receiving, tracking, and documenting the waste certification; and tracking transportation information.

ICDF Waste Generating Site Personnel – This position will be responsible for the shipment profiles and waste certifications and will be present at the dig face to verify shipments. The position is the gatekeeper to the ICDF Complex and has the authority to stop shipments that are outside Waste Profile parameters.

Quality Assurance (QA) Officer – This position will be an independent (non-ICDF Complex) reviewer to ensure operational and waste compliance for the facility. Responsibilities include receipt verification, acceptance of treated waste processes and reliability, inventory database control, and review of inventory against the WAC.

Health and Safety Officer – This position will be responsible for maintaining the industrial hygiene and radiation control coverage for the facility. This will include monitoring the effects of divergent waste streams on the facility, ensuring compliance with OSHA and the Health and Safety Plan (HASP), and establishing and auditing training requirements.

Field Supervisor – This position will be responsible for field coordination of daily activities within the Complex. This includes facility inspections, personnel coordination, and maintaining the operational facility.

Regulatory Specialist – This position will be responsible for overall environmental regulatory compliance. This will include responsibility for environmental reporting, inspections, and oversight, as well as groundwater monitoring for the ICDF Complex.

1.5.2 ICDF Personnel Responsibilities

The ICDF Complex personnel assigned to the management and operations team are responsible for

- Providing Waste Profile numbers
- Establishing and maintaining the ICDF Complex WAC documentation and recordkeeping

- Reviewing and rejecting or approving requests for disposal of new waste forms or chemicals based on health and safety, ICDF landfill/evaporation pond liner compatibility, physical form of the waste, and environmental regulations as set forth in this document and the WAG 3 OU 3-13 ROD

- Integrating waste scheduling and transportation with ICDF Complex users and ICDF Complex personnel

- Maintaining a proactive quality assurance oversight program for timely identification of deficiencies and implementation of appropriate corrective actions

- Inputting/tracking documentation for the SSSTF, ICDF landfill, and ICDF evaporation pond waste locations, including maintaining the disposal maps

- Implementing ARARs as identified in the ROD.

1.5.3 ICDF Complex User Responsibilities

Users of the ICDF Complex are responsible for

- Complying with the ICDF Complex WAC requirements for each intended unit

- Specifying and obtaining approval from the ICDF Complex management prior to shipping waste to the ICDF Complex

- Obtaining and/or confirming regulatory authority for disposal of waste at the ICDF Complex during development ROD or remedial design (RD) phase of the project

- Participating in routine planning discussions and submitting long-term and operational project schedules

- Developing, documenting, and implementing an appropriate sampling and analysis program approved by the ICDF Complex management when required

- Characterizing waste to ensure proper documentation of types and quantities of radionuclides, hazardous constituents, and physical and chemical characteristics

- Evaluating treatment options for waste disposal when applicable

- Following the waste profile process, preparing the Waste Profile and any other required documentation, designating the waste, and obtaining ICDF Complex acceptance for each waste source or group of waste sources

- Participating in a user interface agreement to outline the roles and responsibilities of each entity.

2. WASTE PROFILE PROCESS

2.1 General Requirements

The Waste Profile process described in the subsequent sections ensures that each waste stream entering the ICDF Complex meets the requirements of the appropriate Waste Acceptance Criteria. A waste acceptance process flow diagram is illustrated in Figure 3-1 and described in Section 3.1.

The process described in the following sections must be implemented for each waste stream generated that is destined for the ICDF Complex. For clarity, the process has been outlined, including assigning tasks to the appropriate personnel, e.g., the generating site, the ICDF Complex personnel.

The generating site will

- Notify ICDF Complex operations personnel of waste generation schedules (as described in Section 3.1)
- Complete a Waste Profile for each waste stream prior to waste generation (Appendix A)
- Perform additional characterization data as required by DOE-ID 10985
- Notify INEEL ICDF personnel when sampling is to occur so the appropriate verification sampling can be completed prior to shipment
- Ensure waste is properly packaged, marked, and labeled (Section 5.5)
- Characterize each waste stream by acceptable process knowledge or analytical results described in Sections 2.4 and 2.5
- Complete a Waste Profile for each waste stream in the tracking system database as described in Section 3.5 (Waste Profile sheet is in Appendix A)
- Complete Waste Certification form as described in Section 3.6
- Notify ICDF Complex operations designee that Waste Profile is ready for approval (Section 3.5)
- Coordinate shipment to the ICDF Complex with ICDF Complex operations personnel and generate shipment documentation (described in Section 3.11)
- Submit Waste Profile folder to ICDF Complex records personnel described in Section 3.10.

As described in the following sections, for each waste stream accepted into the ICDF Complex, the appropriate ICDF Complex personnel will implement the following procedure:

- Approve the waste stream profile for acceptance into the ICDF Complex as described in Section 3.5
- Sign off as receiving facility approval on shipment profile in the Waste Tracking System (Section 3.8)
- Provide feedback to generating site regarding waste shipment dates

- Perform receipt verification activities prior to the waste stream arriving at the ICDF Complex (as described in Section 3.8)
- Accept compliant waste into the ICDF Complex as described in Section 3.8 (see Section 3.9 for waste that is noncompliant)
- Compile the waste stream documentation received from generating site as described in Section 3.10.

2.2 General Class of Waste

All wastes to be shipped to the ICDF Complex will be generated from CERCLA remediation, removal, and/or investigation activities within the INEEL boundaries per the OU 3-13 ROD. Upon meeting the requirements stated in the WAC, the following waste types, or combination of waste types, presented in Table 2-1 can be routinely accepted at the ICDF Complex (refer to definitions for each waste type).

Table 2-1. Routinely acceptable types of waste at the ICDF Complex.

Waste Type Accepted at the ICDF Complex	Content Definition
ICDF leachate (F039 waste)	All ICDF leachate is acceptable at the ICDF Complex. Disposal in the ICDF evaporation ponds is the disposal path.
WEEL CERCLA-generated aqueous hazardous, low-level radioactive, and/or mixed waste (other than ICDF leachate)	Aqueous hazardous, low-level radioactive, and/or mixed waste can be accepted at the ICDF Complex. The waste can then be direct disposed or treated to meet the appropriate WAC (on-Site or off-Site).
Nonhazardous/nonradioactive solid waste (i.e., industrial waste)	Waste must be certified to contain no hazardous or radioactive components. Additionally, the generating site must provide justification to the ICDF Complex manager or designee why the waste is not proposed for disposal at the Central Facilities Area (CFA) Bulk Waste landfill.
WEEL CERCLA-generated nonaqueous hazardous, low-level radioactive, and/or mixed waste	Nonaqueous listed and/or characteristic hazardous waste can be accepted at the ICDF Complex. If the waste meets the ICDF landfill WAC, disposal in the ICDF landfill is the disposal path; otherwise, staging, storage, treatment, and/or alternate disposal is required.
TSCA waste (including mixed TSCA waste)	TSCA and mixed TSCA waste can be accepted at the ICDF Complex. If the waste meets the ICDF landfill WAC, disposal in the ICDF landfill is the disposal path; otherwise, staging, storage, treatment, and/or alternate disposal is required.
WEEL CERCLA-generated transuranic (TRU) and mixed-TRU waste	TRU and mixed-TRU waste can be temporarily stored, treated, and/or packaged at the ICDF Complex until fmal disposition is determined.
Hydraulic spills	Hydraulic spill waste can be accepted at the ICDF Complex. If the waste meets the ICDF landfill WAC, disposal in the ICDF landfill is the disposal path; otherwise, staging, storage, treatment, and/or alternate disposal is required.
Petroleum-contaminated soil	Petroleum-contaminated soil that is CERCLA-generated and cannot be sent to the CFA landfarm may be sent to the ICDF Complex.

2.2.1 Exceptions to the WAC Requirements

Any waste that is outside the ICDF Complex WAC will not be accepted into the ICDF Complex, unless a revision to the WAC is made pursuant to the FFA/CO provisions.

2.2.2 Waste Requiring Special Procedures

Some waste types may be encountered that require special procedures. These waste types will be reviewed and may be accepted on a case-by-case basis. This waste meets the requirements of the WAC but requires special procedures for safe operations. The process to obtain approval of a waste requiring special procedures is determined by the source and type of the requirements from which the specific acceptance criterion is derived.

2.2.2.1 ***Request Process.*** A generating site that has identified a waste stream requiring special procedures must fill out a Waste Shipment and Receiving Plan. The O&M Plan will contain the procedure and form. The request must be in writing and sent to the ICDF's operations manager. The request must identify the specific requirement(s) that must be approved and scheduled for the receipt of the waste into the ICDF Complex, the reason a special procedure is necessary, and any proposed alternative methods to meet the general intent of the requirement.

The ICDF operations manager will review the special procedure request and determine the appropriate category and approval process, based on the background documentation for these acceptance criteria. A special procedure can be granted when the ICDF Complex operations manager determines that (a) the procedure does not affect compliance with any regulations, (b) the procedure does not affect compliance with any DOE-ID and/or regulatory agency-approved requirement documents, and (c) the waste does not exceed the criticality limits. This documentation identifies the source(s) of each requirement so a determination can be made whether INEEL ICDF management, DOE-ID, and/or the regulatory agencies must approve the procedure. On completion of this review, ICDF management will respond in writing or set up a meeting to review the special procedure and identify whether the procedure is approved, is denied, or requires additional information or clarification.

Once the special procedures are accepted, the ICDF Complex operations manager, in coordination with the generating site, will set up a schedule for receipt of the waste.

2.3 Composition and Waste Containers

For all waste, a detailed record must be kept of the contents, volume, and weight, as well as any added void fillers, sorbents, stabilization agents, or solidification agents. Incompatible wastes (40 CFR 264.17) that may require special handling or segregation must be identified on the Waste Profile, including Appendix V (40 CFR 264) group number and the precautions must be listed. Once incompatible wastes are received at the ICDF Complex, they will be segregated and stored or staged with like materials based on Appendix V groups.

For containerized waste, the container type, weight, internal and external volume, any shielding provided, and the date packaged must be recorded. See Section 5.5.3 for specific criteria regarding containers.

2.4 Physical and Chemical Characterization

The waste generating sites must determine and document the physical and chemical characteristics of the waste with sufficient accuracy and detail to properly characterize the waste. They must also

provide, in accordance with all applicable regulations (i.e., acceptable knowledge), the information required for the Waste Profile and that required by the appropriate WAC. The following sections describe the physical/chemical characterization requirements for waste acceptance (40 CFR 264.13, 40 CFR 761).

2.4.1 Types of Acceptable Knowledge

This section describes types of information that can be used for physical/chemical characterization including data from waste analysis and knowledge of the materials and/or processes used to generate the specific waste. Acceptable knowledge requirements can be met using one or more of the following:

- Process knowledge
- Mass balance from a controlled process that has a specified output for a specified input including time of generation
- Material Safety Data Sheets (MSDS) on unused chemical products
- Analytical data on the waste or a waste from a similar process, including sufficient information to demonstrate that the two wastes are essentially the same
- Test data from a similar process, including sufficient information to document that the waste is essentially the same as that from a similar process.

In addition, acceptable knowledge requirements can be met through the use of a combination of analytical data or screening results and one or more of the following:

- Documented interview information
- Logbooks
- Procurement records
- Qualified analytical data
- Radiation work packages
- Procedures and/or methods
- Process flow charts
- Inventory sheets
- Vendor information
- Mass balance from an uncontrolled process (e.g., spill cleanup)
- Mass balance from a process with variable inputs and outputs (e.g., washing/cleaning methods).

If the information is sufficient to quantify waste constituents and characteristics, as required by the regulations and facility-specific acceptance criteria, the information is considered acceptable knowledge.

These types of information will require a separate concurrence by the ICDF Complex operations manager prior to the waste being accepted at the Complex.

2.4.2 General Knowledge Requirements

When a waste designation is based solely on process knowledge, the generating site must ensure that the chemical, physical, and radiological properties of the waste are adequately determined. The designation must be accomplished and documented with sufficient accuracy to ensure that subsequent treatment, storage, or disposal of the waste will be protective of human health and the environment. The logic used to make the designation must be documented. The technical basis, including documented historical information, procedures, practices, and information gained from interviews, shall be documented. Any assigned listed waste codes apply to the waste stream throughout the disposition process.

The minimum level of acceptable knowledge must include (1) designation data where the constituents causing a listed waste code to be assigned are quantified and (2) data that address acceptance criteria necessary for proper management of the waste.

Analytical data and/or knowledge of the waste must be sufficient to determine whether the waste is regulated under 40 CFR 26 1 or 40 CFR 76 1 and to assign correct hazardous waste codes (when applicable). When the available information does not qualify as acceptable knowledge or is not sufficient to characterize a waste for management, the sampling and testing methods commonly used to make a hazard determination may be required. The presence or absence of hazardous constituents by chemical analysis alone does not indicate that a listed waste is present. The only way a listed waste code can be assigned to a waste stream is through process knowledge.

In cases where constituents that could cause a waste to be listed are present in a process, but are not expected to be in the waste in concentrations causing the waste to be above LDRs (e.g., those wastes that have been generated outside the WAG 3 AOC or that have triggered placement), sampling and analysis must be performed to demonstrate that the constituents are below regulatory limits for land disposal. This requirement can be met through previous investigations, such as remedial investigations/feasibility studies (RI/FSs) or other CERCLA investigations. This sampling and analysis is required only for initial characterization of the waste stream.

Listed waste must be designated based on process knowledge. Other waste stream designations may be based on process knowledge and/or analytical data. The generating CERCLA project will perform a review to determine whether a listed waste source is present at the remediation waste site. The listed waste review will rely on readily available documents gathered as a part of the standard CERCLA site evaluation or RI/FS. For CERCLA OUs from which listed waste sources are reasonably expected, standard operator interviews should be augmented and documented as necessary to ask questions specifically aimed at identification of potential sources.

2.4.2.1 Implementation of the Data Quality Protocol. Upon receipt of the Waste Profile (6 months in advance of the shipment date), the ICDF operations manager will evaluate the data included with the Waste Profile and determine if they meet the data quality requirements. The data will be compared to DOE/ID-10985 (DOE-ID 2003b) for hrther characterization and verification requirements. At this time, requirements for hrther data needs will be communicated to the project that generates the waste so that the additional data may be collected.

The project that generates the waste will be required to obtain the data prior to submission of the container profile and waste receipt accepted.

If the data on the Waste Profile are acceptable, then the waste profiling process will continue

2.4.3 Land Disposal Restriction Knowledge

For hazardous waste (as defined in 40 CFR 261) that has been generated outside the WAG 3 AOC (or has triggered placement), waste characterization must be sufficient to establish whether the waste is a restricted waste under the LDR provisions of 40 CFR 268 or the alternative LDR treatment standards for contaminated soil under 40 CFR 268.49. If either of those LDR provisions apply, then the applicable treatment standard(s) for that waste must be determined. Data from a CERCLA RI/FS can be utilized for this demonstration, if the sample is a representative sample as defined in 40 CFR 260.10 and the appropriate parameters were analyzed. Additional testing of a representative sample of the waste stream may be required to clarify that the waste meets a concentration-based treatment standard of 40 CFR 268 or 40 CFR 268.49.

2.4.4 Exceptions to Physical and Chemical Characterization Requirements

The following exceptions can be made to the physical/chemical characterization requirements stated previously:

- Hazardous debris managed in accordance with the alternative treatment standards for hazardous debris (40 CFR 268.45) does not require sampling and analysis for adequate physical/chemical characterization.

- Waste that cannot be characterized in accordance with the requirements stated previously because of factors such as unique chemical or radiological hazards of the waste can be characterized by an alternative management path negotiated with the ICDF Complex management.

2.5 Radiological Characterization

The major radionuclides (as defined below) in the waste and the concentration of each major radionuclide must be established with sufficient sensitivity and accuracy to properly classify and manage the waste in accordance with the radiological limits.

2.5.1 Identification of Major Radionuclides

For the purposes of the radiological criteria in this document, major radionuclides are defined as those radionuclides that meet any of the following conditions:

- Any transuranic (TRU) radionuclides present in the nonaqueous waste in concentration exceeding 1 nCi/g

- Any TRU radionuclides present in the aqueous waste in a concentration exceeding 1 nCi/L

- Any radionuclide that accounts for more than 1% of the total radiological activity of the waste

- Any fissionable radionuclide present in the waste in a quantity exceeding 0.1 fissile gram equivalent (FGE) present per container

- Any mobile radionuclide present in a concentration that exceeds its reporting limit.

For waste that cannot be radiologically released, an estimate of radiological constituents will be included in the Waste Profile for tracking purposes.

2.5.2 Acceptable Knowledge and Methods for Establishing Radionuclide Inventories

The radionuclide inventory of a waste must be established through the use of a method or combination of methods capable of identifying and quantifying the major radionuclides present. The methods chosen must provide adequate sensitivity and accuracy to ensure that the waste meets the criteria.

A graded approach should be applied when planning radiological characterization. Using the graded approach, more frequent and detailed analysis and a higher level of statistical confidence are applied when the concentration of radionuclides in the waste approaches one or more of the limits of the criteria. Conversely, waste that measures far below applicable limits of the criteria would not require as extensive or frequent analysis.

Both direct and indirect methods can be used for radiological characterization. Indirect methods (i.e., methods other than direct measurement of a given radionuclide) are acceptable as outlined in the *Federal Register*, November 20, 1997, "Clarification of RCRA Hazardous Waste Testing Requirements for Low-Level Radioactive Mixed Waste-Final Guidance," (62 FR 224):

> This guidance encourages mixed waste handlers to use waste knowledge, such as process knowledge, where possible, in making RCRA hazardous waste determinations involving mixed waste.

The same guidance states:

> Because mixed waste testing may pose the possibility of increased radiation exposure, this guidance also describes methods by which individuals who analyze mixed waste samples may reduce their occupational radiation exposure and satisfy the intent of RCRA testing requirements.

The following characterization methods can be used individually or in combination to establish the radionuclide inventory of the waste:

- Process knowledge includes documented knowledge of the radioactive materials used and the processes that contributed to the radiological content of the waste, along with historical analysis of waste and radiological contamination from the process. Process knowledge can be used to establish the suspected major radionuclides in a waste stream. In addition, process knowledge can be used to eliminate from hrther consideration those radionuclides not present in sufficient concentration to be major radionuclides, as long as the basis of this determination is documented. Process knowledge alone generally may not be sufficient to quantify the total radionuclide inventory of a waste.

- Direct measurement field and laboratory analysis methods, such as radiochemical analysis and surveys with field instruments, must be selected to appropriately detect and quantify the major radionuclides with adequate sensitivity and accuracy for waste classification. Analytical methods that measure gross activity (i.e., not radionuclide-specific) may be used in conjunction with other methods to determine the relative concentration (scaling factors) of each suspected radionuclide and may be corroborated periodically with radionuclide-specific analysis.

- Computer modeling, applied appropriately, may be used in conjunction with other methods for radiological characterization. An individual who is knowledgeable and experienced in the use and limitations of the model must perform the modeling. The assumptions and measurements used as inputs to computer modeling must be documented. The computer software must be controlled in a manner that meets conventional quality assurance requirements. Computer models must be corroborated periodically with direct measurement methods.

- Scaling factors can be used to relate the concentration of a readily measured radionuclide to radionuclides that are more difficult to measure. Scaling factors must be developed from one of the previous methods and should be corroborated periodically with radionuclide-specific analysis. Other methods of radiological characterization could be used but must be clearly documented and approved by the ICDF Complex management. Documentation of the method must include a detailed description of the method, the radionuclides identifiable by the method, and a discussion of precision, accuracy, quality assurance, and quality control methods.

2.5.3 Additional Detail on Mobile Radionuclide Characterization

For low-level waste and low-level mixed waste, mobile radionuclide reporting is necessary for compliance with the ICDF Complex performance assessments. Because of the low reporting limits and difficulty of analysis of certain mobile radionuclides, this section provides additional detail concerning acceptable knowledge and characterization.

The concentration of each mobile radionuclide must be established with the appropriate reporting limit using process knowledge and/or analysis or other available information. Table 2-2 is a list of mobile radionuclides and the reporting limits. If process knowledge alone is used to determine that a mobile radionuclide is not present in a waste stream at the reporting limit, the basis for this determination must be clearly documented. If available analysis techniques cannot detect a mobile radionuclide at its reporting limit, the concentration could be estimated using a combination of process knowledge, scaling factors, and analytical detection limits. Mobile radionuclide reporting is intended to measure only the quantity of isotopes that exceeds INEEL Site natural background concentrations. For waste forms that contain a mobile radionuclide (uranium) that originates from natural background on the INEEL Site, the background concentration of that radionuclide will be subtracted from the total concentration.

Table 2-2. Mobile radionuclides

Mobile Radionuclide	Reportable Concentration (pCi/g)
^{3}H	2.9E+06
^{14}C	8.7E+01
^{36}Cl	2.1E+01
^{79}Se	2.3E+01
^{93}Mo	2.3E+01
^{99}Tc	1.4E+02
^{129}I	6.7E-01
^{187}Re	2.2E+04
^{237}Np	7.3E+00
^{TOT}U	9.3E+00

3. WASTE ACCEPTANCE PROCESS

The following sections give a brief discussion of how the CERCLA waste is processed through the ICDF Complex.

3.1 Waste Flow Through Process

Waste entering the ICDF Complex shall be controlled on the basis of source, physical form, and concentration levels. A uniform and consistent waste acceptance process shall be implemented to include planning, waste certification, waste shipment, and waste receipt verification. The sequenced process for acceptance into the ICDF Complex, as outlined in Figures 3-1 and 3-2, from planning through disposal is discussed in the following sections. The text explaining Figure 3-1 is as follows:

- **Box 1:** The project that will be generating the waste notifies the ICDF Complex of the intent to ship waste to the ICDF Complex for staging, storage, disposal, or treatment and disposal approximately 6 months prior to shipping.

- **Box 2:** The completed Waste Profiles are submitted to the ICDF Complex approximately 3 months prior to anticipated ship date.

- **Box 3:** For each waste, the ICDF Complex operations manager reviews the Waste Profile and accepts or rejects the waste. As part of the Waste Profile acceptance, the ICDF Complex operations manager will determine/approve the destination of the waste within the ICDF Complex.

- **Boxes 4 and 5:** If the Waste Profile is rejected, the profile may be resubmitted by the waste generating site after suitable corrections have been made.

- **Box 6:** After the Waste Profile is approved, the waste will be assigned a shipping date to the ICDF Complex and a destination within the ICDF Complex.

- **Box 7:** The generating site (with ICDF oversight and acceptance) will conduct Waste Profile verification at the remediation site. All of the waste packaged for shipment to the ICDF Complex will be checked against the Waste Profile, visually inspected, and verified during the remediation excavation and/or loading process to ensure that the waste matches the submitted Waste Profile. Verification consists of nonintrusive analysis such as a surface radiological survey.

- **Box 8:** If the Waste Profile verification activities indicate the waste is within the Waste Profile, Container Profile forms will be completed prior to shipping the waste.

- **Box 9:** If the Waste Profile verification activities during loading indicate that the waste does not match the profile, the waste will be set aside at the generating site until resolution of the identified problem and revision of the Waste Profile, if necessary.

- **Box 10:** The ICDF Complex operations manager reviews changes to the Waste Profile and either accepts or rejects the changes. If the changes are not accepted, return to Box 9. If the changes are accepted, return to Box **8** and proceed.

- **Box 11:** After acceptance of the Waste Profile, waste is shipped to the ICDF Complex.

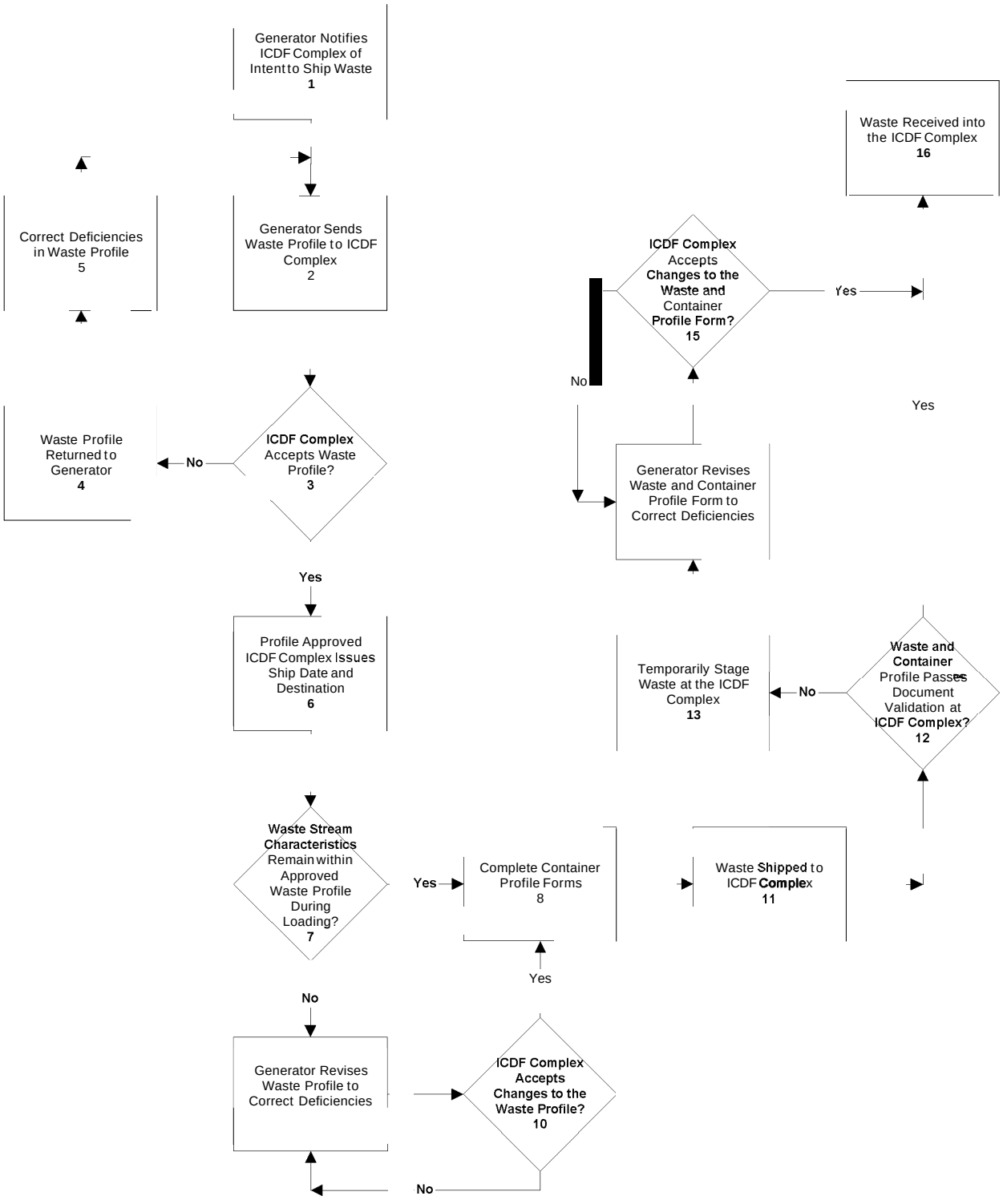


Figure 3-1. Waste flow from generating site to ICDF Complex.

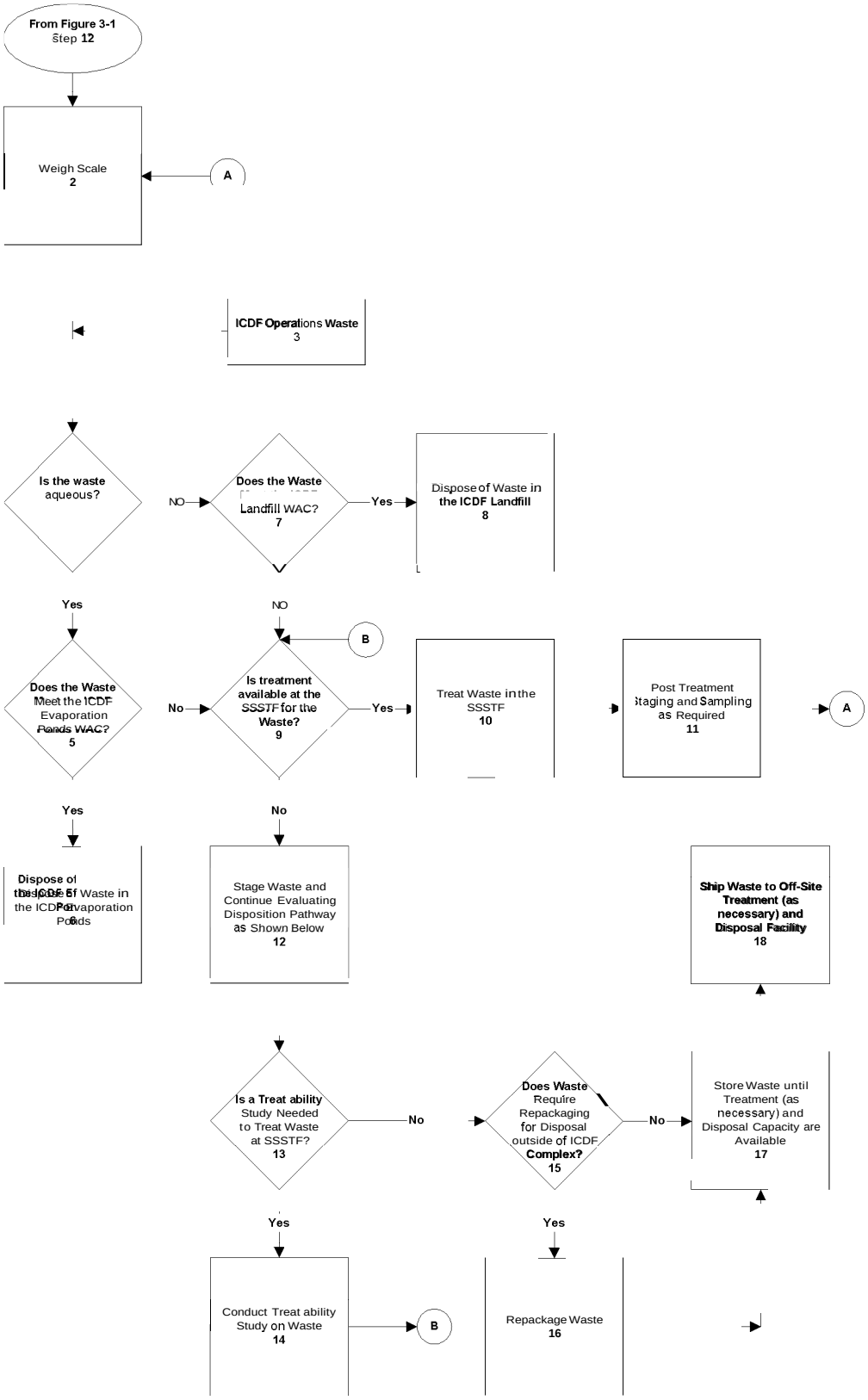


Figure 3-2. Waste flow through the ICDF Complex.

- **Box 12:** Upon receipt at the ICDF Complex, the paperwork and electronic documentation accompanying each shipment of waste will be reviewed. The waste shipment will be checked against accompanying documentation for items such as number of containers, container integrity, bar codes, and waste codes.

- **Box 13:** If the documentation is incomplete or incorrect, the waste will be temporarily staged at the ICDF Complex pending resolution. These actions may include contacting the waste generating site to correct discrepancies on the Waste Profile, requesting more information, correcting mislabeling, etc. The waste will be set aside in the truck holding area inside the ICDF Complex fence. The waste may be held in this area for 10 working days before being sent to an appropriate staging, storage, or disposal facility.

- **Box 14:** The generating site corrects waste and container profiles and certification forms to address deficiencies.

- **Box 15:** The ICDF Complex operations manager reviews the changes to the waste and container profiles and certification forms. If the documentation is not accepted, return to Box 14.

- **Box 16:** If the documentation is correct, the waste is accepted into the ICDF Complex.

Figure 3-2 shows the waste flow within the ICDF Complex. Nonaqueous waste that meets the ICDF landfill WAC for direct disposal in the ICDF landfill will be sent to the ICDF landfill. If the nonaqueous waste requires treatment prior to disposal, it will be sent to the treatment unit or a staging or storage area pending identification of treatment capacity. For nonaqueous wastes that will be treated in the SSSTF, the final disposal destination will be the ICDF landfill dependent on compliance with the ICDF landfill WAC. Aqueous waste that is suitable for direct disposal in the ICDF evaporation pond will be sent to the ICDF evaporation pond. If the aqueous waste requires treatment prior to disposal, it will be sent to the treatment unit or a staging or storage area pending identification of treatment capacity. For aqueous waste treated in the SSSTF, the final disposition into the ICDF landfill or evaporation pond will be dependant on meeting the appropriate WAC. These steps are explained in conjunction with the flow chart in the following:

- **Box 1:** Waste is accepted through the gate into the ICDF Complex after the profile verification.

- **Box 2:** The vehicle stops on the scales and waste is weighed. The weight is recorded on the appropriate waste tracking forms.

- **Box 3:** ICDF operations wastes include secondary waste streams such as decontamination water, PPE, used high-efficiency particulate air (HEPA) filters, etc.

- **Box 4:** If the waste is nonaqueous proceed to Box 6; for aqueous waste proceed to Box 4

- **Box 5:** Waste is evaluated to determine if it meets the evaporation pond WAC.

- **Box 6:** Waste will be disposed in the evaporation pond.

- **Box 7 and 8:** If the waste meets the ICDF landfill WAC, the waste proceeds directly to disposal in the ICDF landfill (Box 7).

- **Box 9:** If the waste does not meet the ICDF landfill WAC or the evaporation pond WAC, then the waste may be sent to the SSSTF for treatment, provided it can be treated to meet the ICDF landfill, ICDF evaporation pond, or an off-Site WAC.

- **Box 10:** The waste (either aqueous or nonaqueous) is treated at the SSSTF to meet the ICDF landfill WAC.

- **Box 11:** Treated waste is staged and sampled as necessary to verify that it meets the ICDF landfill, ICDF evaporation pond, or an off-Site WAC. When analytical results indicate that the treated waste meets the ICDF landfill WAC, the waste will be weighed prior to disposal (reentering the process at Box 2).

- **Box 12:** If the waste does not meet the ICDF landfill or evaporation pond WAC and cannot be treated at the SSSTF to meet the ICDF landfill WAC, the waste will be staged and an evaluation of other disposal pathways will be initiated.

- **Box 13:** Evaluate whether a treatability study is necessary to demonstrate that a minor change in the treatment technique at the SSSTF would allow the waste to meet the ICDF landfill, evaporation pond, or an off-Site WAC.

- **Box 14:** If a treatability study is needed then it will be conducted and the waste stream will re-enter the process at Box **8.**

- **Box 15:** If the waste treatment cannot be modified to meet the WACs then it will be determined if repackaging for disposition off-Site is required. This will include an economic evaluation of the off-Site costs and other available options.

- **Box 16:** The waste will be repackaged for storage or off-Site shipment.

- **Box 17:** Appropriately packaged waste will be stored until the waste can be treated (if necessary) and the appropriate disposal facility has been determined.

- **Box 18:** The waste will be sent to an off-Site treatment (as necessary) and/or disposal facility.

3.2 Waste Acceptance Scheduling Requirements

All ICDF Complex users shall provide long-term and operational project schedules to the ICDF Complex management and operations team for use as a planning tool. Failure to provide the ICDF Complex management and operations team with project schedules or to participate in routine planning discussions may result in delays to the acceptance process.

3.2.1 Long-term Schedule

For projects anticipating to dispose waste in the ICDF Complex, the generating site shall submit an overall project schedule to the ICDF Complex operations manager. Information necessary for the long-term scheduling include at a minimum the following:

- Start date

- Completion date

- Waste volume
- General class of waste (as described in Section 2.2)
- Primary waste forms (e.g., soil, concrete, purge water, other aqueous waste, steel, wood asbestos)
- Potential radioactive and hazardous constituents
- Applicable listed waste codes
- Waste disposition pathway (e.g., ICDF landfill, ICDF evaporation pond, treatment at the SSSTF, staging, storage, or off-Site disposal)
- Special handling requirements, including anticipated need for treatment at the SSSTF, as applicable.

Table 3-1 lists the major planning steps that must be performed for shipping waste to the ICDF Complex.

Table 3-1. Schedule for CERCLA project and ICDF Complex interaction

Information	Date Information Due to ICDF Complex Management
CERCLA project name	6 months prior to anticipated ship date
Anticipated waste type	6 months prior to anticipated ship date
Projected schedule for waste generation	6 months prior to anticipated ship date
Waste Tracking System Waste Profile approval	3 months prior to anticipated ship date
Preliminary acceptance and authorization to ship	6 weeks prior to anticipated ship date
Shipping schedule (number of trucks/containers per day) and days of shipment	1 week prior to first ship date
Receipt of waste volume	Actual ship date

3.2.2 Operational Schedule

Operational project schedules shall be provided to the ICDF Complex waste tracking specialist and users shall participate in routine planning discussions. Operational schedules shall include anticipated waste to be shipped for each active Waste Profile based on a rolling 6-week projection. Operational schedules shall be provided to the ICDF Complex management and operations team as field activities are initiated and throughout the duration of the project.

It will be the responsibility of the generating WAG manager to notify the ICDF Complex waste tracking specialist of any delay or deviations from the Waste Profile that may occur after the receipt of the shipping date. This may require the Waste Profile to be amended and a new shipping date issued.

3.3 Waste Tracking System

The Waste Tracking System (WTS) is built around four fundamental functions: (1) waste characterization and verification, (2) container characterization and waste acceptance, (3) waste container movement and processing, and (4) final disposition. Waste characterization is performed by the

generating WAG and entered into the database along with the type of container and proposed shipping data. Each container will have a history and a graphical genealogy of the respective container. The container characterization and waste acceptance is the process of getting the profile accepted into the ICDF Complex and assuring the paper work is in place prior to shipment of the waste. Upon acceptance by ICDF and receipt of a shipping date, the waste container movement and processing function is initiated. This function will track the waste from the generation point into the ICDF Complex, through the waste flow process within the ICDF Complex for treatment, storage, disposal, and off-Site shipment, the fourth function. At the end of the process, a Waste Profile folder is generated and retained as a record file.

The tracking system will be able to generate the following reports and activities:

- Continually updating the estimates of radiological and contaminant of concern (COC) incremental changes
- Adjusting inventories according to the results of analysis of waste receipts
- Adjusting inventories on the basis of waste characterization improvements
- Verification or modification of waste projections based on best available data
- Determining consistency of waste forms with the three sets of WAC
- Subtracting constituent concentrations based on leachate recovery
- Residual sources of radioactive materials.

There will also be flags associated with the tracking system to highlight load limits, acceptance sequences, special handling requirements, and other information that will be important in loading the landfill. Truck weights and entry sequences will also be tracked. Detailed operating procedures to implement, run, and maintain this system will be part of the Operations and Maintenance (O&M) Manual for the ICDF Complex.

3.3.1 Compliance with ARARs

The WTS addresses two specific ARARs that were identified in the OU3-13 ROD dealing with waste tracking, i.e., record keeping and surveying requirements (see Table 3-2).

Table 3-2. WTS compliance with ARARs.

Regulation (40 CFR)	Compliance Demonstration
§ 264.309 – The owner or operator of a landfill must maintain the following items in the operating record required under $264.73: (a) on a map, the exact location and dimensions, including depth of each cell with to permanently surveyed benchmarks; and	WTS, the INEEL Site-wide waste tracking system, has the capability to generate an electronic map. Permanent benchmarks will be installed and used as reference points for this map. Locations for each cell will be maintained on this system.
(b) The contents of each cell and the approximate location of each type of hazardous waste.	Using the XYZ coordinate system available in the WTS, each hazardous waste type received at the facility will be tracked to its final location within the landfill cells. Coordinate cell size will be addressed in the "ICDF Waste Placement Plan." (to be provided in the ICDF Complex RA Work Plan)

3.4 Data Quality Objectives

Data quality objectives (DQOs) will be developed to implement the waste verification and QA requirements identified on the site-specific Waste Approval Form. The DQOs will be part of the generating site's FFA/CO documentation and subject to Agency review and approval.

3.5 Waste Profile

Waste Profile information will be required for each waste entering the ICDF Complex. The generating site of the waste will provide a completed Waste Profile for approval a minimum of 3 months prior to anticipated shipping. (A sample Waste Profile has been provided in Appendix A.) In addition to the Waste Profile, the generating site will be required to provide the following:

- On-Site Waste Tracking Form
- Hazardous waste determination
- LDR determination (if applicable)
- Free liquids test per O&M procedure
- Special analytical process required for a specific waste type
- Special handling requirements
- Debris treatment process if performed at the generating WAG.

Testing will include the appropriate radiological and chemical screening results, and the results of these tests will be filed with the copies of the Waste Profiles and all other supporting material for each waste.

The waste generating site will provide a copy of the analytical results attached with the Waste Profile. The nonintrusive inspection will be conducted at the time the waste is received at the ICDF Complex and documented by the ICDF QA officer. Acceptance will be complete when the ICDF operations manager signs the appropriate line on the Waste Profile.

The ICDF operations manager can use the information contained on the Waste Profile to alert future disposal contractors of possible disposal restrictions. If, at the time of screening, the waste determination does not meet the profile, the ICDF management and operations team will work with the generating WAG until an accurate determination can be made or will arrange for hrther actions. If the waste is determined unacceptable for ICDF landfill disposal, and after consultation with the waste generating sites, storage at the SSSTF may be an option.

3.5.1 Waste Profile Reevaluation Process

The ICDF Complex operations manager will reevaluate a Waste Profile under the following conditions:

- The process generating the waste has changed

- Inspection or analysis indicates that the waste received at the ICDF Complex does not match the waste identified on the accompanying pre-acceptance documentation or is not in compliance with this WAC.

When a profile is re-evaluated, the generating site may be requested to do one or more of the following:

- Verify that the current Waste Profile is accurate
- Supply a new Waste Profile
- Look for alternative disposal
- Submit a sample for parameter analysis.

3.6 Verification as Packaged

Prior to shipment, the generating site is required to verify that the waste stream is packaged to meet the requirements of the three sets of ICDF WACs. This check is to ensure that waste received at the ICDF Complex will not be rejected due to packaging at the generation site. The generating site shall determine the frequency of this verification. Table *3-3* will be used to determine that appropriate packaging has been completed prior to shipment. These are verification inspections of the container, not the waste.

Table 3-3. Potential verification-as-packaged parameters.

Verification Parameter	Physical Form Applicable	Available Test Methods	Acceptable Results
Physical characteristics	All	Visual inspection	Minimal loose contamination on outside of container.
pH	Aqueous liquid	pH paper	pH identified by generating site.
Solids screen for free liquids	All solids	Visual inspection	Ensure that there are no liquids that readily separate from the solid portion of a waste under ambient temperature and pressure.
Organic vapors in headspace	Volatile organic compounds	Calibrated photoionizing detector or flame ionizing detector	Results from greater than 5 second measurement determines routing through the ICDF Complex. Field screening measurement only.
Direct radiation measurement	All	As determined by radiological control technician (RCT)	± 100% for radiation levels. ≤ 10 mR/hour or ± 20% for radiation levels >10 mR/hour.
Contamination smears (outside of container only)	All	As determined by RCT	Should not significantly exceed reported values.

3.7 Receipt Verification

Waste receipt verification will be performed by the ICDF Complex operations at the SSSTF. Receipt verification will be performed through a combination of inspections of the incoming shipment and cross-checks of the incoming waste against the On-Site Waste Tracking Form and other appropriate documentation. The minimum checks will include the Waste Profile number, number of containers, and

types and labeling of containers. Additional verification may be done on a random basis as determined by the ICDF Complex QA officer.

3.7.1 Verification of Waste Containers

Verification of waste containers will include the following:

- Verify number of containers matches shipping documents
- Ensure container integrity; check for bulges, holes, significant rust, dents, breaches, leaks, or similar evidence of degradation or mishandling, as necessary
- Ensure containers are properly closed, as necessary
- Ensure all containers are properly marked and labeled (cross reference with Waste Profile), as necessary
- Ensure that trucks used in the transport of bulk waste are tight, tailgates are up, and liners are intact, if necessary
- Ensure each container's Waste Tracking System barcode ID matches the container profile ID
- Have RCTs perform radiological survey of containers and transport equipment or vehicles, as necessary
- Ensure each waste stream has been properly evaluated for compatibility and segregation, as necessary.

3.7.2 Verification of Shipping Documentation

Verification of shipping documentation will include the following:

- Check Waste Profile against actual waste containers
- Check On-Site Waste Tracking Form
- Check and receive certification.

3.7.3 Followup Documentation

After the shipment has been verified, the ICDF Complex operations manager (or his designee) will complete the followup documentation as follows:

- Initial the Waste Tracking System shipment profile as shipment received
- File hard copy of the On-Site Waste Tracking Form.

3.8 Noncompliant Waste

Waste received at the ICDF Complex with noncompliant conditions shall require appropriate resolution prior to waste acceptance. Resolution alternatives may include, but are not limited to

- Correction of the noncompliant condition at the ICDF Complex
- Conditional acceptance of the waste at the ICDF Complex
- Staging at an appropriate location until resolution of the issue

In addition to short-term rectification of the noncompliant condition to permit disposal, hrther steps shall be taken to determine the underlying cause of the problem and implement corrective actions as necessary to prevent recurrence. A re-occurrence of noncompliant shipments from a generating site may result in rejection of the waste and termination of shipments until the issues have been resolved.

3.9 Records

All records will be kept on file at the ICDF Complex as outlined in the FFA/CO (DOE-ID 1991). The INEEL records document personnel and procedures will be employed to maintain the documentation required for the ICDF Complex. The records and documents that will be kept and maintained include

- Waste Profiles and any accompanying forms (e.g., analytical results)
- Map/cell locations of wastes
- Inspection records
- Tank records until closed per 40 CFR 264, Subpart J, and Idaho Administrative Procedures Act (IDAPA) 58.01.05.009
- Asbestos-TSCA waste records
- Audit, surveillance, and observations of generating site's waste characterization activities
- Training records
- Any other applicable documentation.

3.10 Packaging and Shipping

The waste-generating organization is required to prearrange the delivery time and date of all waste shipped to the ICDF Complex and ensure that an On-Site Waste Tracking Form accompanies all wastes brought to the ICDF Complex. These arrangements can be made during the initial contact, if the waste has been accepted for receipt. A shipment sent without prior arrangement will be rejected.

3.10.1 Packaging and Labeling Requirements

Packaging and labeling of waste must be done in accordance with Section 5.5.

3.10.2 Shipping Documentation and Authorization to Ship

The CERCLA project generating the waste must receive authorization from the ICDF Complex management to ship waste. The waste-generating organization is required to prearrange the delivery time and date of all waste shipped to the ICDF Complex prior to disposal at the ICDF and to ensure that Waste Profile and On-Site Waste Tracking Forms accompany all wastes brought to the ICDF Complex. A shipment sent without prior arrangement will be rejected.

Shipping documentation must accompany the load and be received at the gate of the ICDF Complex with the load. Documentation consists of the On-Site Waste Tracking Form. The approved Waste Profile must be available electronically prior to the load arriving at the gate.

All shipments from TAN or RWMC entering the ICDF Complex must have an approved profile as well as the required DOT shipping documents. The manifesting requirements in 40 CFR Part 262, Subpart B and the pre-transport requirements in Section 262.32(b) do not apply to the transport of hazardous waste along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right-of-way (Section 262.20[f]).

4. WASTE ACCEPTANCE BASIS

4.1 Criteria Basis

The ICDF Complex is authorized to accept only CERCLA waste from INEEL activities consistent with the OU 3-13 ROD. Waste may be accepted in the ICDF landfill through a CERCLA ROD or removal action memorandum issued in accordance with CERCLA and the National Contingency Plan. On a case-by-case basis, other documents may be used to provide regulatory authority for disposal of CERCLA-generated waste at the ICDF landfill. Waste that has not been coordinated in accordance with the waste acceptance process defined in Section 2.2 shall not be accepted at the ICDF landfill.

The basis for acceptance criteria includes protection of human health and the environment, control of waste form, compliance with environmental regulations (ARARs) as authorized by the OU 3-13 ROD, and development of a chemical, radiological, and physical WAC.

4.1.1 Remedial Design Analysis

The ICDF Complex operations and waste treatment used the Design Basis Inventory (EDF-ER-264) for operational limitations. The results of the studies are summarized in Table 4-1.

4.1.2 Protection of Human Health and the Environment

Worker protection shall be provided by compliance with the requirements of the site-specific health and safety plan for the ICDF operations.

The waste handling at the ICDF landfill shall be consistent with ALARA requirements for maintaining worker exposure, in accordance with DOE O 5400.5. The primary long-term routes of exposure to hazardous constituents and the radionuclides that are of concern after placement of waste in the ICDF landfill include the ingestion of contaminated groundwater or intrusion into the waste.

4.1.3 Compliance with ARARs

The ICDF Complex is a part of a CERCLA RA, and the ARARs are clearly identified in the OU 3-13 ROD. Compliance with these ARARs is documented in the ARARs crosswalk for the ICDF Complex, which is found in Appendix A of the RD/CWP for the WAG 3 SSSTF (DOE-ID 2002b).

Compliance with NESHAP limits will be conducted in conjunction with INEEL on a site-wide basis. The ICDF Complex will not contribute more than 10 mrendyear (the federal allowable limit) to the maximally exposed individual (MEI) at the site boundary. To ensure that the ICDF Complex is not a major factor in changing INEEL NESHAP status, an operational goal for the Complex will be set at 1 mrem/yr. This will be met through operational constraints to be outlined in the ICDF Complex RA report, developed prior to startup of the facility. The emissions from the ICDF Complex will be calculated on an annual basis and included with the INEEL Annual NESHAP report. If the operational goal of 1 mrendyear is exceeded, the Agencies will be notified.

4.1.4 Coordination with ICDF Landfill, ICDF EP, SSSTF, and Off-Site WACs

Waste entering the ICDF Complex and secondary waste streams can have one of five disposition pathways. It can be sent directly to the ICDF landfill, directly to the ICDF evaporation pond, directly to the SSSTF for treatment, stored at the SSSTF storage areas, or sent off-Site. In order for these dispositions to happen, the waste must meet the WAC for the disposal/treatment unit that has been identified as the receiving facility.

Table 4-1. Summary of SSSTF study results influencing the ICDF Complex WAC.

Document	Summary of Results
Treatability Study Test Plan for Soil Stabilization at the SSSTF (to be provided in the ICDF Complex RA Work Plan)	This work plan discusses the objectives and methods of conducting treatability studies on waste material. The wastes are primarily soils containing relatively low levels of radioactivity and RCRA heavy metals, namely barium, cadmium, chromium, lead, mercury, and silver. To dispose of these waste soils, the heavy metals must be removed or stabilized such that the final treated form does not leach any of the heavy metals above the standards defined by the EPA in 40 CFR 268. The treatment method proposed in this treatability study is a Portland cement-based chemical fixation system that stabilizes the heavy metals in a nonleachable form. This study will use actual waste material. The waste samples will be subjected to a matrix of tests wherein the Portland cement will be supplemented with chemical additives and the waste loading. Alternative non-Portland cement-based, chemical methods may replace this method. The treated waste samples will be analyzed via the toxicity characteristic leaching procedure (TCLP) and the paint filter test for free liquids to determine if the treated material would meet disposal criteria.
EDF-ER-302, SSSTF Design Radiological Control Analysis	Contaminated soil will be transported through the SSSTF. Some of this soil will receive stabilization treatment within the SSSTF. Also decontamination of equipment will be performed. This Engineering Design File (EDF) addresses the radiological control (RadCon) issues of these activities. The results of the review of radiation control issues are documented per this EDF. The radiological control requirements involving worker safety are identified. The completed Radiological Control Design Review form is contained in this EDF. The radiation source terms are analyzed and bounded. The bounding analysis provides a basis for the adequacy of the design for RadCon requirements. The requirements are that radiation is to be controlled at the source. With adequate ventilation, including HEPA filters, containment and shielding, contamination control, and monitoring with fixed and portable RadCon instruments, the SSSTF design will adequately control the radiation at the source.
EDF-ER- 296, Process and Treatment Overview for the Minimum Treatment Option	This document presents an overview of the "minimum treatment" process for CERCLA wastes at the SSSTF. Under this option, soil from three CERCLA sites at WAG 3 and from one at WAG 4, are used as the design basis for a stabilization treatment operation. This represents a significant departure from the basis presented in the *Preliminary Design Report (30% Design)* (DOE-ID 2000) as this reduces the potential waste volume from 36,000 to 1,260 yd^3. In addition to the reduced waste load, the targeted waste soils are packaged in a similar manner and, because of this, a smaller and perhaps more economical stabilization unit may be justified. Pertinent information is reiterated from the 30% design report as it applies to the minimum treatment option, including characterization data of the targeted wastes and the approach for determining a viable cement formulation. Finally, a list of design constraints and requirements for a stabilization unit is given that is similar to a requirements list being released to potential vendors. In addition to treating soils, the stabilization unit will be equipped to accommodate small volumes of aqueous liquids/sludges.

Table 4-1. (continued)

Document	Summary of Results
EDF-1730 SSSTF Debris Treatment Process Selection and Design	The purpose of this document is to analyze possible debris treatment options and to select a debris treatment process to be included in the SSSTF design. Hazardous debris, subject to the Treatment Standards for Debris (40 CFR 268.45), will be processed in the SSSTF and must be processed accordingly. Although soil and debris processing requirements are similar, they are subject to different standards. Several debris treatment technologies were identified in accordance with the Alternative Treatment Standards for Debris in Table 1 of 40 CFR 268.45. Technologies considered were from three general categories: extraction, destruction, and immobilization. The technologies were prescreened and further analyzed against evaluation criteria, including quality control, operations, cost, implementability, inherent safety, and flexibility. Based on the analysis performed in this study, cement-based microencapsulation was selected as the primary debris treatment process to be utilized in the SSSTF. This treatment process will be used to treat all known debris delivered to the SSSTF.

The Waste Profile Sheet, in Box #6, Figure 3-1, requires that the ICDF Complex operator identify the destination of the waste upon entrance into the ICDF Complex. When the Waste Profile is received at the ICDF Complex the destination will be confirmed and approved. The Waste Profile will be compared to the appropriate WAC to ensure that waste receipt at the ICDF Complex is acceptable. Upon receipt of the waste at the ICDF Complex, the ICDF Complex operations manager will direct the load to the appropriate location for processing.

5. ACCEPTANCE CRITERIA FOR THE ICDF COMPLEX

5.1 Interim Staging and Storage Annex Requirements

The SSA currently in operation will be incorporated into the SSSTF through the submittal and approval of the ICDF Complex RA Work Plan (in preparation). The SSA will be subject to all the following requirements in this WAC.

5.2 Prohibited Waste

The waste types not accepted by the ICDF Complex are listed in Table 5-1.

Table 5-1. Summary of wastes *not* accepted at the ICDF Complex.

Waste Type	Comment
High-level waste	Highly radioactive waste material, including the liquid waste, resulting from the reprocessing of spent nuclear fuel, will not be accepted.
Spent nuclear fuel	Fuel that has been withdrawn from a nuclear reactor following irradiation and that has not yet been reprocessed to remove its constituent elements.
Waste capable of detonation or explosive reactivity	Waste capable of detonation or explosive reaction when subjected to a strong initiating source, or if heated under confinement.

5.3 Physical and Chemical Criteria

5.3.1 Physical Criteria

Waste being accepted into the ICDF Complex or secondary waste streams must meet the physical criteria for each independent unit, i.e., landfill, evaporation pond, or SSSTF treatment limit. If waste is destined for off-Site disposal it must meet the physical criteria for the receiving facility. If the waste is being stored, the physical criterion is the appropriate packaging.

5.3.2 Chemical Criteria

The chemical criteria for the ICDF Complex are those that are specific to each individual WAC. Section 5.3 in the landfill WAC and the evaporation pond WAC outline the limits for the units. If the limits for the individual unit WAC (e.g., landfill, evaporation pond, treatment unit) are met, the waste may be accepted into the ICDF Complex. If the waste is expected to be shipped off-Site and has been accepted into the ICDF Complex for repackaging, it must meet the WAC of the receiving facility.

5.3.3 Hazardous and Toxic Air Pollutant Limits

The ICDF Complex will comply with the air emission standards identified in the "Rules for the Control of Air Pollution in Idaho" (IDAPA 58.01.01.585 and IDAPA 58.01.01.586) for the off-Site maximum exposed individual.

5.4 Radiological Criteria

5.4.1 Radiological Concentration Limits

The ICDF Complex WAC radiological material is based on a combination of the total allowable inventory of radionuclides that may impact the environment and the protection to worker health and safety. Where there are two or more radionuclides present in a waste, the "sum of the fractions" method shall be used to determine acceptability.

5.4.2 Radiological Inventory Limits

The radiological inventory limits will be maintained to stay within the facility safety envelope and authorization basis. These are determined by the hazard category of the facility.

5.4.3 NESHAP Emission Limits

The ICDF Complex will not contribute more than 10 mrem/yr to the MEI at the site boundary. To ensure that the ICDF Complex is not a major factor in changing the INEEL NESHAP status, an operational goal of 1 mrem/year will be set as an operational constraint.

5.4.4 Criticality Safety Limits

At the present time, there are no wastes identified for disposal that might approach criticality limits. However, should such waste be identified, the generating site would be required to provide all documentation to demonstrate that storage, staging, sizing, and treatment or disposal in the ICDF Complex would not approach criticality. Table 5-2 provides the conversion for the major radionuclides to provide criticality limits. The detailed calculations for these conversion factors are presented in Appendix B.

Table 5-2. Plutonium-239 fissile gram equivalent (FGE) correction factors.

Isotope	Correction Factor	Isotope	Correction Factor
^{233}U [a]	1.0 E+00	^{242}Am	3.46 E+01
^{235}U [b]	1.0 E+00	^{243}Am	1.29 E-02
^{237}Np [c]	1.5 E-02	^{243}Cm	5.0 E+00
^{238}Pu [c]	1.13 E-01	^{244}Cm	9.00 E-02
^{239}Pu [c]	1.0 E+00	^{245}Cm	1.50 E+01
^{240}Pu [c]	2.25 E-02	^{247}Cm	5.00 E-01
^{241}Pu [c]	2.25 E+00	^{249}Cf	4.50 E+01
^{242}Pu [c]	7.50 E-03	^{251}Cf	9.00 E+01
^{241}Am	1.87 E-02		

a. ^{233}U is normally negligible unless the materials have been enriched in ^{233}U.
b. ^{235}U is not included in calculating FGE unless it is enriched (greater than or equal to 0.72 **wt %** ^{235}U in uranium).
c. For conservatism, all plutonium is normally considered to be ^{239}Pu unless the isotopic composition is known.
Source: ANS 8.15.

5.4.5 Package External Concentration Limits

Removable contamination on accessible surfaces of waste packages shall not exceed those listed in Table 5-3 excerpted from the *INEEL Radiological Control Manual* (Radiological Control Department 2000).

Table 5-3. Contamination levels on outside of containers.

Radionuclide	Removable (dpm/100 cm^2)	Total (Fixed + Removable) (dpm/100 cm^2)
U- Nat. U-235, U-238 and associated decay products.	1,000 alpha	5,000 alpha
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129.	20	500
Th–nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, 1-126, 1-131, I-133.	200	1,000
Beta-gamma emitters (nuclides with decay modes or other alpha emissions or spontaneous fission) except Sr-90 and others noted above. Includes mixed fission products containing Sr-90.	1,000 beta-gamma	5,000 beta-gamma
Tritium and tritiated compounds.	10.000	NA

5.4.6 Package Dose Rate Limits

Contact-handled waste shall not exceed 500 mR/h at 1 meter. Non-contact-handled waste shall meet the applicable dose rate restrictions of DOT or an approved packaging safety analysis. Non-contact-waste shall be configured for unloading such that personnel exposures are maintained ALARA. Non-contact-handled waste will be taken on a case-by-case basis as it will require special coordination with the ICDF Complex personnel to set up appropriate worker protection.

5.5 Packaging Criteria

Packaging of all waste generated outside the WAG 3 AOC and designated for shipment to the ICDF Complex will be in compliance with the OU 3-13 ROD ARARs, DOE O 435.1 required DOT regulations (49 CFR 172, 49 CFR 173, and 49 CFR 178-180), the *INEEL Packaging and Transportation Safety Manual* (DOE-ID 1999b), NRC regulations (10 CFR 71), appropriate RCRA/TSCA regulations (40 CFR 262, 40 CFR 761, and 40 CFR 763, as invoked by DOE O 435.1), and this WAC. Appropriate personnel will be consulted prior to generation of any waste to identify proper containment to be used for each waste stream. The CERCLA waste generating sites must ensure waste materials are packaged in containers that are in good condition, materials are compatible with the waste stored in them, and void spaces in containers are reduced as much as possible. The ICDF Complex management should be consulted prior to the use of containers other than those specified in this WAC.

5.5.1 Outer Packages

Container specifications for both nonaqueous and aqueous wastes being shipped to the ICDF Complex are included in Table 5-4 and Table 5-5, respectively. Approved containers for those wastes other than those listed in Tables 5-4 and 5-5 may be used on a case-by-case basis only if they have received authorization by the ICDF Complex operations manager prior to shipment.

Table 5-4. Container specifications for nonaqueous wastes.

Waste Type	DOT Steel Drum"	Roll-Off Containers"	Dump Trucks"	Vulcan Boxes [a] 68 x 45 x 36 in.	Secondary Containment	Wood Boxes" 2 × 4 × 8 ft 4 x 4 x 4 ft 4 x 4 x 8 ft
Hazardous waste	XX	XX	XX	XX	—	XX
Low-level waste[b]	XX	XX	XX	XX	—	XX
Mixed waste[b]	XX	XX	XX	XX	—	XX
TSCA or mixed TSCA waste[b, c] (PCB)	XX	XX	XX	XX	XX	—
TSCA or mixed TSCA waste[b, d] (asbestos)	XX	—	—	—	—	XX
TRU or mixed TRU waste[b]	XX	—	—	XX	—	XX
Special case	XX	XX	XX	XX	[e]	XX
Bulk soil	XX	XX	XX	XX	—	XX

a. Drums, roll-offs, Vulcan Industries Inc. boxes, and INEEL wood boxes will be lined with polyethylene liners, burrito bags, or supersacks. Roll-off containers and dump trucks Will have covers.
b. Low-level radioactive waste shall be packaged for disposal in accordance With 10 CFR 61.56(a). The container must also be surveyed to ensure occupational exposures to radiation are < 500 mR/h at 1 meter for the exterior of the container. If the containers radiation is > 500 mR/h, the container must be shielded by other containers while Within the ICDF Complex.
c. In addition to meeting the requirements in Section 5.5, packaging used for transporting polychlorinated biphenyl (PCB) waste shall conform to the packaging requirements of 40 CFR 761 (DOE-ID 1999b).
d. In addition to meeting the requirements in Section 5.5. packaging used for transporting asbestos waste shall conform to the packaging requirements of 40 CFR 763 (DOE-ID 1999b).
e. Depending on the waste stream, secondary containment may be necessary.

5.5.2 Condition of Containers

Containers shall be in good condition, with no visible cracks, holes, bulges, substantial corrosion, or other damage that could compromise integrity.

5.5.3 Container Compatibility and Segregation

The waste generating site is responsible for ensuring that general requirements associated with container compatibility and segregation are followed for all shipments to the ICDF Complex (49 CFR 177.848 as invoked by DOE Order 435.1, 40 CFR 264.172, 40 CFR 264.177, and IDAPA 58.01.05.009). In addition, the following conditions must be met:

1. All packaging must be compatible with the waste stored in them.

2. Incompatible wastes may not be placed in the same container.

3. Waste must not be placed in an unwashed container that previously held an incompatible waste.

4. A package containing a waste that is incompatible with a waste that is placed nearby must be separated by proper means.

Table 5-5. Container specifications for aqueous wastes

Waste Type	DOT Steel Drum	Secondary Containment	Cross-linkable Polyethylene Tanks	
			VCT"	VOT"
Hazardous waste	XX	—	XX	—
Low-level waste[b]	XX	—	XX	—
Mixed waste[b]	XX	—	XX	—
TSCA or mixed TSCA waste[b, c,] (PCB)	XX	XX	XX	—
TRU or mixed TRU waste[d]	XX	—	XX	—
Purge / development water	XX	—	XXX	XX
Case-by-case waste	XX	XX	XX	XX

a. VCT (Vertical Closed Top) and VOT (Vertical Open Top) aboveground tanks Will meet or exceed ASTM D1998, Type I: Tanks molded from cross-linkable polyethylene.
b. Low-level radioactive waste shall be packaged for disposal in accordance With 10 CFR 61.56(a). The container must also be surveyed to ensure occupational exposures to radiation are < 500 mR/h at 1 meter for the exterior of the container. If the containers radiation is > 500 mR/h, the container must be shielded by other containers while Within the ICDF Complex.
c. In addition to meeting the requirements in Section 5.5, packaging used for transporting polychlorinated biphenyl (PCB) waste shall conform to the packaging requirements of 40 CFR 761 (DOE-ID 1999b).
d. TRU and remote-handled wastes Will be packaged in DOT 7A Type A 55-gal drums or 6M Shipping Packages IES-51526).

5.5.4 Securing Waste and Shielding

Large heavy items must be secured in containers by bracing, blocking, or other means to prevent damage to the container during handling and transportation. When shielding is used to reduce the surface dose rate of a waste container, the shielding and waste must be secured to prevent shifting during handling and transportation.

5.5.5 Handling Packages

All packages must be configured for safe unloading by forklift or crane. Alternate means of unloading provided by the generating WAG may be allowed with approval from the ICDF Complex operations manager. Packages that must be unloaded by crane shall be equipped with a lifting system designed to safely lift the fully loaded package. All slings and lifting devices shall meet the requirements of the DOE Standard "Hoisting and Rigging" (DOE-STD-1090-99). For packages that have special unloading requirements, information must be provided by the generating WAG to the ICDF Complex operations manager concerning the methods for unloading before the shipment is scheduled. Sacrificial rigging shall be provided for remote-handled waste packages. Rigging shall not contain regulated materials, such as lead.

The health and safety procedures for handling containers at the ICDF Complex will be developed prior to personnel actually handling any waste containers. Containers of waste shall not be opened, handled, or stored in a manner that will cause leakage (40 CFR 264.173(b), IDAPA 58.01.05.008).

5.5.6 Package Labeling and Marking

Waste containers shall be labeled as described in the following sections. Bulk wastes are exempt from labeling requirements at the ICDF landfill. For unusual waste forms, special-labeling provisions can be arranged with the ICDF Complex organization. Table 5-6 indicates the label specified for each type of waste.

Table 5-6. Label identification table.

Waste Type	Radioactive	CERCLA Waste	PCB Waste	Pending Sampling and Analysis	CERCLA Database Barcode Label
Hazardous waste	NA[a]	X[b]	NA	NA	X
RAD	X	X	NA	NA	X
RAD & mixed RAD	X	X	NA	NA	X
TSCA (asbestos waste only)	X	X	X	NA	X
Other asbestos/RAD waste	X	X	X	X	X
Case-by-case (waste dependent)	X	X	X	X	X

a. NA = Not applicable.

b. X = Applicable.

All containers used for waste storage must be properly labeled in accordance with both EPA and applicable DOT requirements before delivery to the ICDF Complex. Each manager generating waste will ensure that each drum/container is properly marked and labeled, first while the waste is accumulated, and again before the waste is moved from the WAG site.

The marking on the containers must always be clearly visible for inspection of each container, and all container labels must be placed where they are clearly visible during storage and shipment. Drums will be labeled on top and on one side. Boxes will be labeled on the top and on two opposing sides of the container. During shipment to the ICDF Complex, a container must also display DOT labels, manifest number, gross weight, and the shipper's complete name and address. Containers of waste shall not be opened, handled, or stored in a manner that will cause leakage (40 CFR 264.173(b), IDAPA 58.01.05.009).

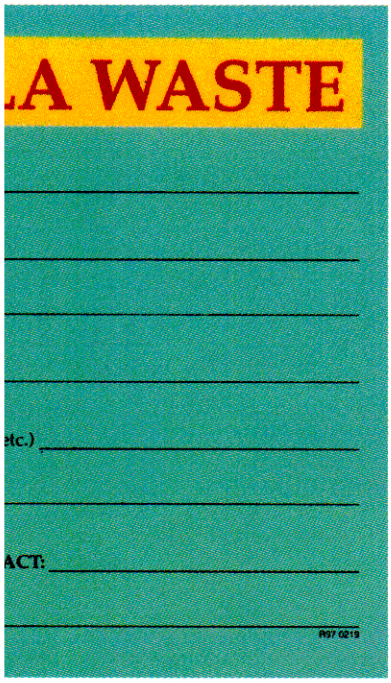
5.5.6.1 Radioactive Waste. As required by the *INEEL Radiological Control Manual* (Radiological Control Department 2000), radiation labels will be completed by a radiation control technician (RCT) and placed on the top and on two opposing sides of the container.

5.5.6.2 CERCLA Waste. All CERCLA remediation waste entering the ICDF Complex will be labeled with a "CERCLA Waste" label that includes an accumulation start date, waste description, applicable codes, and the generating site's name. Figure 5-1 provides an example of a standard label.

5.5.6.3 TSCA Waste Labels. Each PCB item or container entering the SSSTF must be appropriately labeled with a PCB M_L or M_S mark (see example shown in Figure 5-2). In addition, each waste container containing PCBs must be marked with the out-of-service date and weight in kilograms.

Asbestos-containing material will be labeled per the INEEL Asbestos Program.

5.5.6.4 Barcode Label. All waste containers entering the ICDF Complex will have a Waste Tracking Barcode label (see example shown in Figure 5-3). This barcode refers to the associated container profile in the Waste Tracking System database. A duplicate barcode is printed with each barcode so that one barcode can be placed on a side of the container and one on the top of the container. The barcode must also appear on the On-Site Waste Tracking Form.



te label.

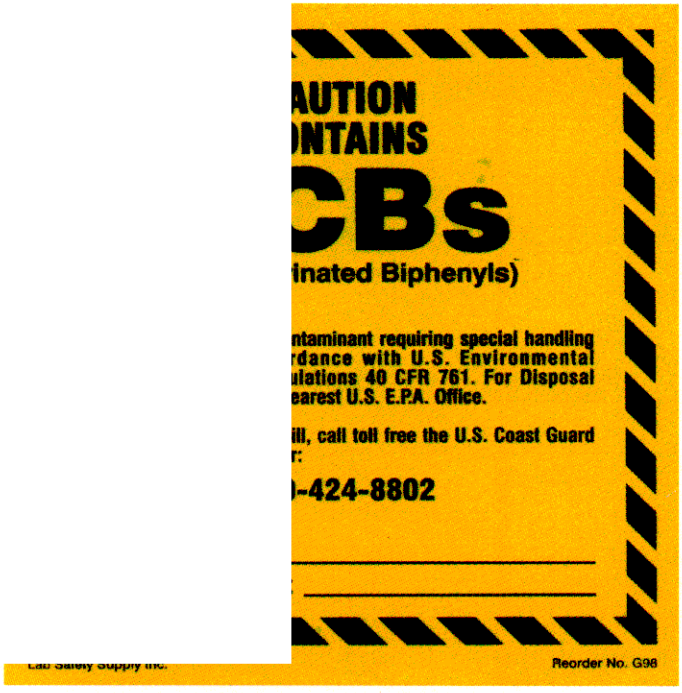


Figure 5-2. Example of a standard PCB waste label.

Figure 5-3. Example of a waste tracking system barcode label.

5.5.7 Vehicle Placarding

Vehicles that are destined for the ICDF Complex and that are transporting hazardous material will be placarded as required by DOT in 49 CFR 172 and 173, and in accordance with 49 CFR 172.500 through 172.560 (as invoked by DOE Order 435.1).

5.5.8 Bulk (Noncontainerized) Waste

The majority of waste will be to be sent to the ICDF Complex in bulk. This waste may arrive in roll-off containers, dump trucks, tankers, or other containers. This includes soil, building rubble, liquid wastes, and other homogeneous waste having relatively low concentrations of radionuclides and hazardous chemical constituents.

Waste streams that comply with the ICDF landfill WAC including the bulk criteria in the following sections can be accepted for disposal at the ICDF landfill as bulk shipments. The ICDF Complex operations manager will evaluate waste streams that comply with the ICDF WAC but do not meet these bulk criteria on a case-by-case basis. The case-by-case acceptance process is detailed in Section 2.2.1.

Bulk shipments must comply with all labeling requirements as outlined for other containers and vehicle placarding.

5.5.9 Radiological Contamination Limits

The radiological contamination limits for waste containers entering the ICDF Complex is <500 mR/h at 1 m.

5.5.10 Physical Limits

Physical limits for waste proposed for storage at the ICDF Complex is dependent on final disposition. Physical limits for each unit are outlined in the appropriate WAC. Section 6 outlines the criteria for the SSSTF. If waste is to be sent off-Site it will be required to meet the physical constraints of the receiving facility.

6. ACCEPTANCE CRITERIA FOR THE STAGING, STORAGE, OR TREATMENT UNITS

This WAC is for the minimal treatment portion of the SSSTF. This section sets the criteria for the storage, staging, or treatment of waste at the ICDF Complex. It sets the applicable limits for each component of the SSSTF.

6.1 Prohibited Waste

The waste types not accepted into the treatment unit are listed in Table 6-1. Waste prohibited for storage are the same as those listed in Table 5-1 for the ICDF Complex.

Table 6-1. Summary of wastes ***not*** accepted at the treatment unit.

Waste Type	Comment
Waste outside size limits for treatment unit	Waste greater than 6 in. will not be accepted (for soil)
Wastes outside chemical criteria	Waste that has chemical concentrations greater than those that can be treated with the standard formula.
Waste above the radioactive criteria	Waste >500 mR/h if shielding or other institutional/engineering controls are not implemented.

6.2 Physical and Chemical Criteria

6.2.1 Chemical Criteria

The SSSTF will treat wastes using a robust treatment formula. There are no chemical limits for the treatment unit. If the resultant waste after treatment meets the landfill WAC, the waste is acceptable.

6.2.2 Physical Criteria for Treatment

Waste must be less than 6 in. in diameter.

6.3 Radiological Criteria

Radiological criteria for storage are the same as for the ICDF Complex (see Section 5.4).

6.3.1 Radiological Concentration Limits for Treatment

Waste must be less than 500 mR/h at 1 meter for normal handling procedures. If waste >500 mrem/hr is identified, shielding and other institutional/engineering controls must be implemented.

Concentration limits for the treatment unit are dependent on the waste stream, the radionuclides present, and the process that generated the waste to be treated. The 10 CFR 835 requires that measures be taken to maintain radiation exposures in controlled areas ALARA. The primary method used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding); administrative controls shall be incorporated only as supplemental methods and for specific activities where physical design features are demonstrated to be impractical.

In order to ensure worker safety, a procedure will be developed and included in the O&M manual that will outline the limits for internal/external exposures. Waste destined for the treatment unit will be screened for radiation levels and, dependent on the concentration, specific procedures will determine the ALARA requirements.

6.4 Packaging Criteria

Packaging of CERCLA-generated waste shall be in compliance with the OU 3-13 ROD ARARs. Container specifications are listed in Tables 5-4 and 5-5. Void space should be kept to a minimum to allow for acceptance at off-Site facilities if the waste cannot be disposed in the ICDF Complex. Containers must be able to withstand outdoor storage conditions. Cardboard boxes will require special approval and immediate treatment.

6.4.1 Condition of Containers for Storage

Outer containers shall be in good condition, with no visible cracks, holes, bulges, substantial corrosion, or other damage that could compromise integrity.

6.4.2 Container Compatibility and Segregation for Storage

All wastes designated for temporary storage at the SSSTF will be shipped in the acceptable containers, Waste will be segregated by the generating site and noted in shipping documentation. Waste generating sites will segregate wastes to ensure that incompatible wastes are containerized separately to ensure safety and compliance.

6.4.3 Shielding Waste for Storage

Waste that is over the 500 mR/h must be shielded to protect worker exposures. Waste requiring shielding must be identified and the generating WAG shall provide the shielding necessary for storage.

6.4.4 Handling Packages

Containers received at the SSSTF for storage will be off-loaded from the transport vehicle to the storage area. If special handling requirements are necessary due to weight or radiation issues, the containers must be equipped to allow for these requirements prior to shipment. Containers are placed so that the compatibility markings are visible for inspection.

6.4.5 Containers for Bulk Liquid Storage

Vertical Closed Top (VCT) and Vertical Open Top (VOT) tanks will be used to store liquid and solid or other CERCLA-generated waste. They have been fitted with secondary containment when required. The larger VOT tanks will be used as secondary containment. Existing tanks are constructed of cross-linkable high-density polyethylene. Specifications meet or exceed the resin type, design standard, sizing, intended service, fittings, accessories, and warranty required for rotationally-molded aboveground storage tanks, as per ASTM D 1998-91, Type I, "Tanks molded from crosslinkable polyethylene." Additional tanks should be of equivalent construction and design.

6.5 Radiological Contamination Limits

The radiological contamination limits for waste containers entering the SSSTF are <500 mR/h at 1 m. Waste exceeding these limits may be accepted on a case-by-case basis with appropriate approval from the ICDF Complex operations manager.

6.6 Physical Limits SSSTF Treatment Unit for Debris

The physical limits for the SSSTF treatment unit/process are dependent on the ability of the unit to handle the size and physical nature of the waste stream (see Table 6-2).

Table 6-2. Physical limits and restrictions for debris

Waste Type	Limits and Restrictions
Wood boxes	Boxes must be no larger than 4 x 4 x 8 ft.
Concrete debris"	Concrete may be sent to the SSSTF in one of two different forms: 1. Reduced to rubble with a maximum dimension of approximately 1 ft 2. Large blocks or slabs may be shipped under the following criteria: • It must not exceed the gross weight limit for the container. • It must not extend above the side walls of the container. • It shall not exceed 20-ft length. • All rebar must be cut flush with the surface.
Other debris	Debris must be sent in a container that has the structural integrity to withstand the treatment process.
Rebar	Rebar should be cut to lengths of approximately 4 ft and be placed in wood boxes with other hard debris.

a. Debris not boxed in 2 x 4 x 8-ft or 4 x 4 x 8-ft boxes must be preapproved by the operations manager. Other packaging may be acceptable but will require special operational adjustments. In particular, the container must have the structural integrity to withstand the treatment process.

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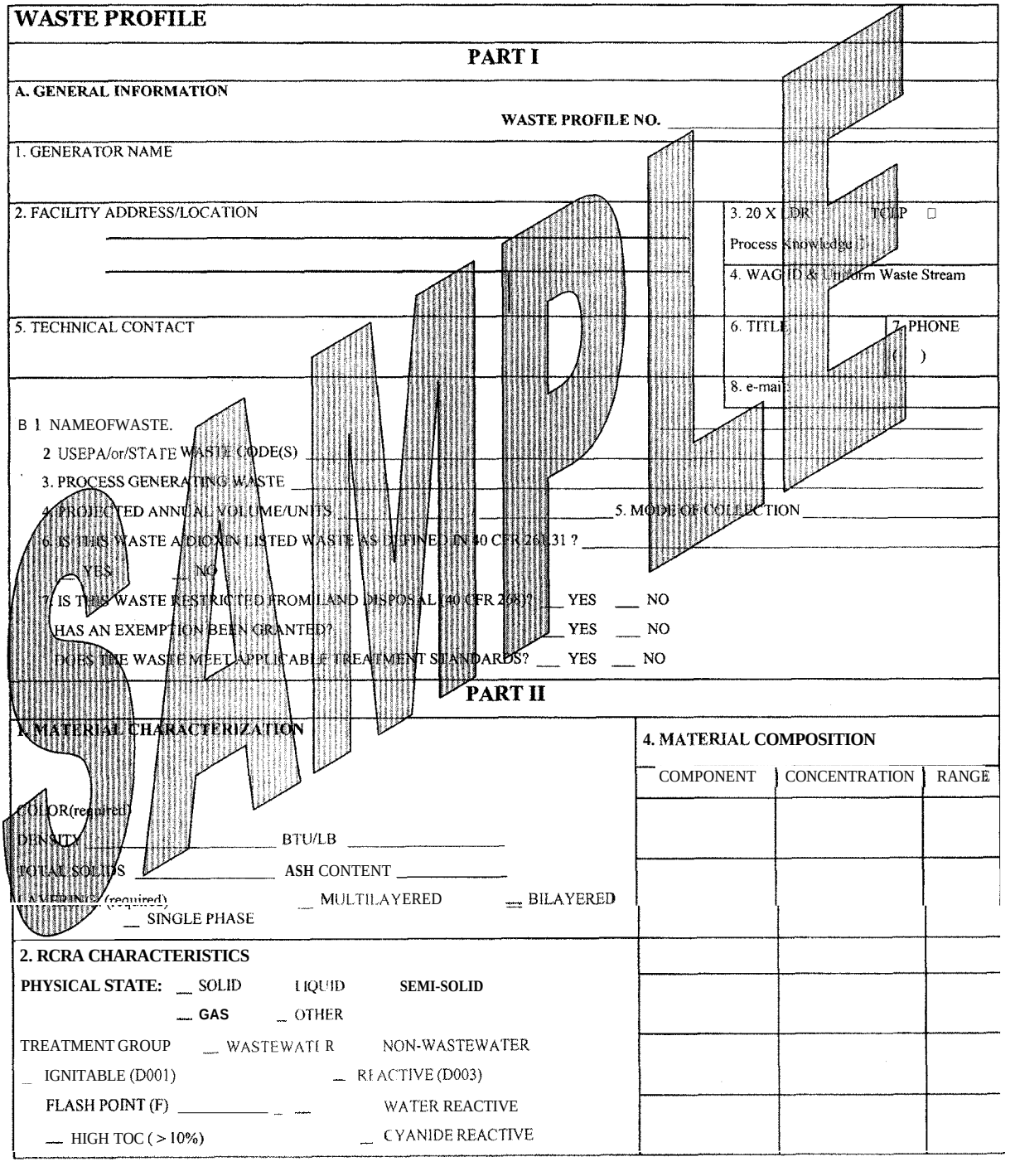
Appendix A

Waste Profile

Appendix A

WASTE PROFILE



WASTE PROFILE

PART I

A. GENERAL INFORMATION

WASTE PROFILE NO. _____

1. GENERATOR NAME

2. FACILITY ADDRESS/LOCATION

3. 20 X DR TCLP ☐
Process Knowledge

4. WAG ID & Uniform Waste Stream

5. TECHNICAL CONTACT

6. TITLE

7. PHONE
( )

8. e-mail

B 1 NAMEOFWASTE.

2 USEPA/or/STATE WASTE CODE(S) _____

3. PROCESS GENERATING WASTE _____

4. PROJECTED ANNUAL VOLUME/UNITS _____ 5. MODE OF COLLECTION _____

6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 ? _____
YES NO

7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? ___ YES ___ NO
HAS AN EXEMPTION BEEN GRANTED? ___ YES ___ NO
DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? ___ YES ___ NO

PART II

1. MATERIAL CHARACTERIZATION

COLOR(required)

DENSITY _____ BTU/LB _____

TOTAL SOLIDS _____ ASH CONTENT _____

(required) ___ MULTILAYERED ___ BILAYERED
___ SINGLE PHASE

2. RCRA CHARACTERISTICS

PHYSICAL STATE: ___ SOLID LIQUID **SEMI-SOLID**
___ **GAS** ___ OTHER

TREATMENT GROUP ___ WASTEWATER NON-WASTEWATER

___ IGNITABLE (D001) ___ REACTIVE (D003)

FLASH POINT (F) _____ ___ WATER REACTIVE

___ HIGH TOC (> 10%) ___ CYANIDE REACTIVE

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE

__ LOW TOC (< 10%)
__ CORROSIVE (D002)
pH _____
__ CORRODES STEEL

__ SULFIDE REACTIVE
__ TOXICITY CHARACTERISTIC
(SEE PART III)

TOTAL _____ 100%

3. CHEMICAL COMPOSITION (ppm or mg/L)

COPPER _____ PHENOLICS _____
NICKEL _____ TOTAL HALOGENS _____
ZINC _____ VOLATILE ORGANICS _____
CHROMIUM-HEX _____ PCBs _____
(OTHER) _____

NOTE: EXPLOSIVES, SHOCK-SENSITIVE, PYROPHORIC, AND ETIOLOGICAL WASTE NORMALLY MAY NOT BE ACCEPTED BY THE SSA DESIGNEE WITHOUT SPECIFIC APPROVAL.

5. SHIPPING INFORMATION

DOT HAZARDOUS MATERIAL? __ YES __ NO
PROPER SHIPPING NAME _____
U.N. OR
HAZARD CLASS _____ N.A. NO. ___
ADDITIONAL DESCRIPTION _____
METHOD OF SHIPMENT __ BULK __ DRUM
CERCLA REPORTABLE QUANTITY (RQ) _____
EMERGENCY RESPONSE GUIDE PAGE
DOT PUBLICATION 5800.4 PAGE NO. ____
SPECIAL HANDLING INFORMATION _____

6. GENERATOR INFORMATION

BASIS FOR INFORMATION

__ CHEMICAL ANALYSIS *(ATTACH RESULTS)*

__ USER KNOWLEDGE *(ATTACH SUPPORTING DOCUMENTS. Explain how and why these documents comply with RCRA requirements.*

I, _____ HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN AND ALL ATTACHED
(Print or Type Name)
DOCUMENTS IS TO THE BEST OF MY KNOWLEDGE AN ACCURATE REPRESENTATION OF THE WASTE TURNED IN TO THE SSA.

ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE OF GENERATOR'S REPRESENTATIVE	**DATE**

7. WASTE ACCEPTANCE INTO: □ ICDF landfill □ SSTF □ Evaporation Pond

SIGNATURE OF ICDF Complex DESIGNEE **Preliminary Acceptance**	**DATE**
SIGNATURE OF ICDF Complex DESIGNEE **Final Acceptance**	**DATE**

PART III

HAZARDOUS CHARACTERISTIC LIST

☐ Total Metals ☐ TCLP* ☐ Process Knowledge

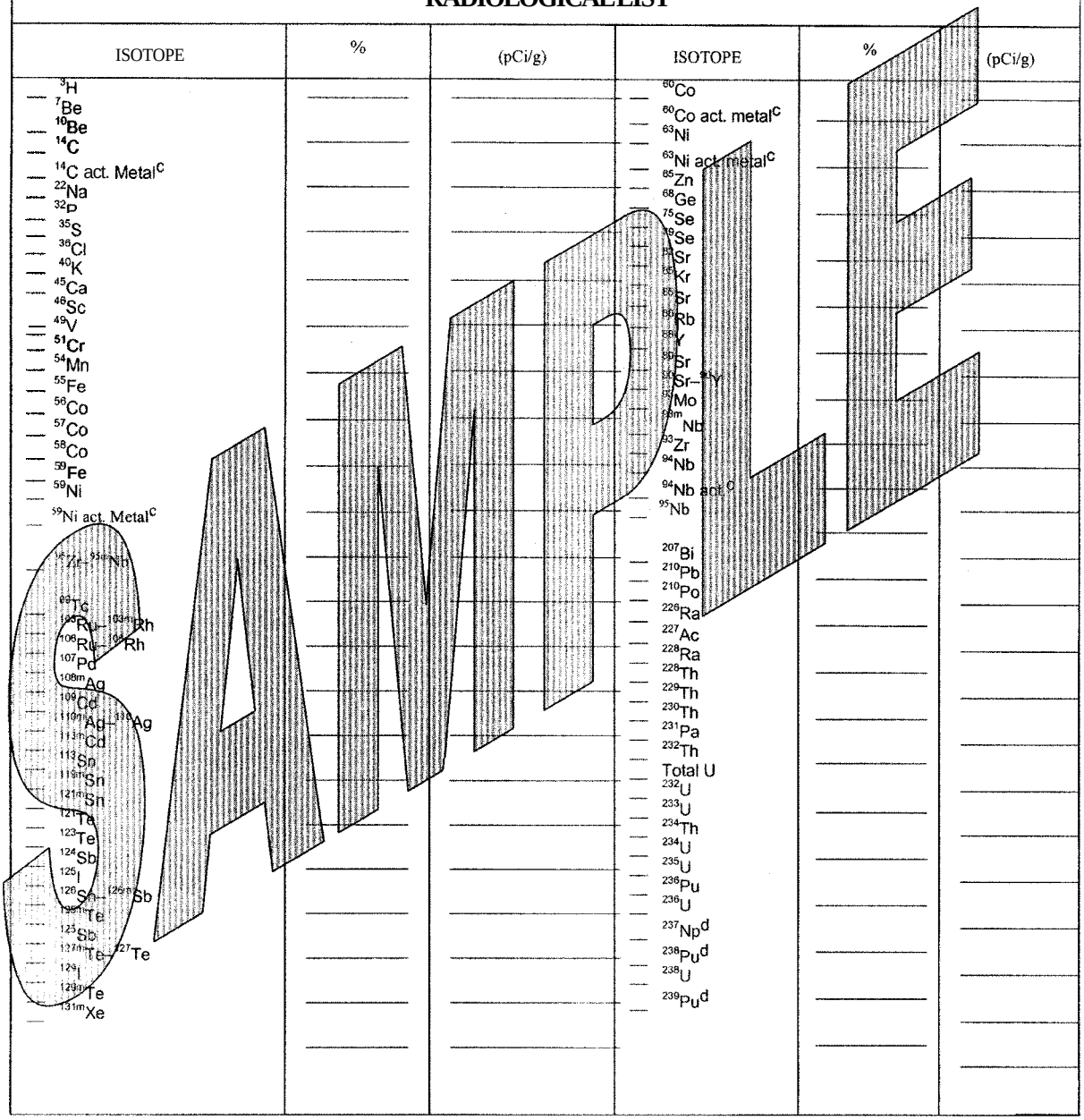
CONTAMINANT	EPA HW No	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
ARSENIC	D004		HEXACHLORO-1,3,-BUTADIENE	D033	
BARIUM	DO05		HEXACHLOROETHANE	D034	
BENZENE	DO18		LEAD	D008	
CADMIUM	D006		LINDANE	D013	
CARBON TETRACHLORIDE	DO19		MERCURY	D009	
CHLORDANE	D020		METHOXYCHLOR	D014	
CHLOROBENZENE	D021		METHYL ETHYL KETONE	D035	
CHLOROFORM	D022		NITROBENZENE	D036	
CHROMIUM	D007		PENTACHLOROPHENOL	D037	
O-CRESOL	D023		PYRIDINE	D038	
M-CRESOL	D024		SELENIUM	Dol0	
P-CRESOL	D025		SILVER	D011	
CRESOL	D026		TETRACHLOROETHYLENE	D039	
2,4-D	D016		TOXOPHENE	D015	
1,4-DICHLOROBENZENE	D027		TRICHLOROETHYLENE	DO40	
1,2-DICHLOROETHANE	D028		2,4,5-TRICHLOROPHENOL	D041	
1,1-DICHLOROETHYLENE	D029		2,4,6-TRICHLOROPHENOL	D042	
2,4-DINITROTOLUENE	D030		2,45-TP (SILVEX)	DO17	
ENDRIN	D012		VINYL CHLORIDE	**Do43**	
HEPTACHLOR (AND ITS HYDROXIDE)	D031				
HEXACHLOROBENZENE	D032				

***TCLP data are required for waste streams where total metals exceed 20X the TCLP LDRs.**

All required analysis for this sheet must be attached prior to submittal.

PART IV

RADIOLOGICAL LIST



RADIOLOGICAL LIST (continued)

ISOTOPE	%	(pCi/g)	ISOTOPE	%	(pCi/g)
___ ^{133}Ba			___ $^{240}Pu^{d}$		
___ ^{134}Cs			___ $^{241}Am^{d}$		
___ ^{135}Cs			___ ^{241}Pu		
___ $^{137}Cs-^{137m}Ba$			___ $^{242m}Am^{d}$		
___ ^{140}Ba			___ ^{242}Cm		
___ ^{141}Ce			___ $^{242}Pu^{d}$		
___ $^{144}Ce-^{144}Pr$			___ $^{243}Am^{d}$		
___ ^{147}Nd			___ $^{243}Cm^{d}$		
___ ^{147}Pm			___ ^{244}Cm		
___ ^{147}Sm			___ $^{244}Pu^{d}$		
___ ^{150}Eu			___ $^{245}Cm^{d}$		
___ ^{151}Sm			___ $^{246}Cm^{d}$		
___ ^{152}Eu			___ $^{247}Bk^{d}$		
___ ^{152}Gd			___ $^{247}Cm^{d}$		
___ ^{153}Gd			___ $^{248}Cm^{d}$		
___ ^{154}Eu			___ $^{249}Cf^{d}$		
___ ^{155}Eu			___ ^{250}Cf		
___ ^{170}Tm			___ $^{250}Cm^{d}$		
___ ^{175}Hf			___ $^{251}Cf^{d}$		
___ ^{181}Hf			___ ^{252}Cf		
___ ^{182}Ta			___ ^{254}Es		
___ ^{185}W					
___ ^{187}Re					
___ ^{195}Au					
___ ^{203}Hg					
___ ^{204}Tl					

PART V

LABELING	Yes	no
1. Are containers marked with the waste generation date?		
2. Does container have CERCLA label?		
3. Does container have WTS label?		
4. PCB Containing Waste (40 CFR 761.45)?		
Large PCB Mark (M_L) [for large containers] | Small PCB Mark (M_S) [used for small containers]		

PART VI

PACKAGING TYPE

Waste Type	55 Gallon Drum[a] Or other sized steel drums	Roll Off Containers[a]	Crosslink Polyethylene Tanks (storage) Or tanker truck (transport) VCT[c]	VOT[c]	INEEL Wood Boxes[a] 2 x 4 x 8 ft 4 x 4 x 4 ft 4 x 4 x 8 ft
Hazardous	XX	XX	—	—	XX
RAD[b]	XX	XX	—	—	XX
RAD & Mixed RAD[b]	XX	XX	—	—	XX
Asbestos-TSCA	XX	XX	—	—	XX
Asbestos-TSCA/RAD Waste[b]	XX	XX	—	—	XX
Purge Water	—	—	XX	XX	—
Case-by-Case[d]	XX	XX	XX	XX	XX

a. Drums, roll-offs, and INEEL wood boxes will be lined with polyethylene liners (or supersacks).

b. Low-level radioactive waste shall be packaged for disposal in accordance with 10 CFR 61.56(a). The container must also be surveyed to ensure occupational exposures to radiation are < 500 mR/h at 1 meter for the exterior of the container. If the containers radiation level is > 500 mR/h then the container must be shielded by other containers within the SSA.

c. VCT (Vertical Closed Top) and VOT (Vertical Open Top) above ground tanks will meet or exceed ASTM D 1998-91, Type I: Tanks molded from crosslinkable polyethylene.

d. Wastes accepted on a case-by-case basis could require special container requirements. Therefore, the generator must verify proper containers with 49 CFR 101, Subpart C

NOTE: Other types of containers may be used if they have received approval prior to shipment.

Appendix B

Fissionable Material Content Limits

Appendix B

Fissionable Material Content Limits

The following describes the limits for fissionable material content in waste packages sent to the ICDF covered by criteria provided in Chapters 3.0 through 6.0.

B-1. EXEMPT MATERIALS

The following materials are exempt from criticality safety controls at all TSD units (HNF-PRO-537):

- 15 grams or less of any combination of ^{233}U, ^{235}U, ^{237}Np, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}Pu, ^{242}Pu, and ^{241}Am
- 2 grams or less of any fissionable nuclide with atomic number greater than or equal to 95 (excluding ^{241}Am)
- Depleted or natural uranium in any amount (i.e., uranium containing less than 0.72 weight percent ^{235}U).

B-2. NONEXEMPT MATERIALS IN STANDARD CONTAINERS APPLICABLE TO ICDF COMPLEX

Certain nonexempt materials in standard packaging configurations are acceptable at the ICDF landfill.

The fissionable material limits shall be expressed in ^{239}Pu FGEs. Table B-1 is used to determine the total quantity of fissionable material in a waste container by multiplying the gram quantity of each listed isotope by the correction factor and summing the results.

Specific container limits are shown in Table B-2. Note that some of the limits in Table B-2 are based on criticality prevention requirements. Higher quantities of fissionable nuclides could be allowed on a case-by-case basis.

B-3. NONEXEMPT QUANTITIES OF URANIUM-BEARING WASTE APPLICABLE TO CWC, LLBG, AND WRAP

This section only applies to uranium-bearing waste where the uranium is enriched to 0.72% ^{235}U or greater and the total quantity of fissionable material per container exceeds that listed in Table B-2. Use of these limits for uranium-bearing waste exceeding 1% enrichment requires that the uranium be in an insoluble or stabilized form.

For uranium-bearing waste that contains uranium in a single enrichment, the limits of Table B-3 shall apply to each container in a shipment. For criticality control, other transportation limits might apply to the entire shipment.

For uranium-bearing waste containers that have uranium in a variety of different enrichments or contain any other isotopes listed in Table B-1, the fissionable material allowed shall be determined by the sum-of-fractions method as follows:

- The total U quantity present (grams) for each enrichment will be divided by the total quantity allowed (second column in Table B-3). Enrichments shall be conservatively rounded up to the next higher value listed. The result is the uranium limit fraction (ULF).

- A uranium limit fraction shall be determined for each enrichment.

- All the uranium limit fractions are summed, the total must be less than or equal to 1.

The limit for all fissionable isotopes, other than ^{235}U in the waste matrix, shall be determined if the total FGE (excluding ^{235}U) greater than 1 for these isotopes (it is neglected if the total FGE is less than or equal to 1). This nonuranium limit fraction (NLF) shall be determined as follows:

$$\mathrm{NLF} = \frac{FGE(without\ ^{235}U)}{100\mathrm{FGE}}$$

The nonuranium limit fraction must be less than or equal to 1.

The container limit fraction is determined by adding the total uranium limit fraction and the nonuranium limit fraction. The container limit fraction must be less than or equal to 1.

B-4. NONEXEMPT QUANTITIES OF FISSIONABLE RADIONUCLIDES IN OTHER CONFIGURATIONS

Limits for other configurations than those shown in Sections 2 and 3 may be requested as described in the text, Section 5.4.3.

Table B- 1. Plutonium-239 fissile gram equivalent correction factors.

Isotope	Correction Factor	Isotope	Correction Factor
^{233}U[a]	1.0 E+00	^{242}Am	3.46 E+01
^{235}U[b]	1.0 E+00	^{243}Am	1.29 E-02
^{237}Np[c]	1.5 E-02	^{243}Cm	5.0 E+00
^{238}Pu[c]	1.13 E-01	^{244}Cm	9.00 E-02
^{239}Pu[c]	1.0 E+00	^{245}Cm	1.50 E+01
^{240}Pu[c]	2.25 E-02	^{241}Cm	5.00 E-01
^{241}Pu[c]	2.25 E+00	^{249}Cf	4.50 E+01
^{242}Pu[c]	7.50 E-03	^{251}Cf	9.00 E+01
^{241}Am	1.87 E-02		

a. ^{233}U is normally negligible unless the materials have been enriched in ^{233}U.

b. ^{235}U is not included in calculating FGE unless it is enriched (greater than or equal to 0.72 **wt%** ^{235}U in uranium).

c. For conservatism, all plutonium is normally considered to be ^{239}Pu unless the isotopic composition is **known.**

Sources: DOE/WIPP 89-004 (1996) and ANSVANS 8.15.

Table B-2. Fissionable material content limits for certain standard containers

Container Type	Fissionable Material Content[a]
208-L (55-gal) or larger steel drum, where fissile material is contained in 20% or more of the container volume	177 FGE[b]
208-L (55-gal) or larger steel drum, where fissile material is contained in less than 20% of the container volume	100 FGE[b]
208-L (55-gal) lead-lined steel drum	100 FGE[b]
DOT or NRC -approved containers (e.g., DOT Specification 6M)	Maximum fissile content may not exceed that which is acceptable for transportation as specified in the DOT regulations or the NRC Certificate of Compliance
Steel box containing flushed and drained equipment and/or HEPA filters: all of the following limits shall apply:	• 325 FGE per piece of equipment • 353 FGE/m^3 (10 EGE/ft^3) on HEPA filters • 15 FGE in waste other than equipment or HEPA filters • 250 FGE total in box larger than 0.76 x 0.76 x 0.76 m (2.5 x 2.5 x 2.5 ft) • 325 FGE total in box larger than 0.9 x 1.4 x 1.5 m (3 x x 5 ft) • 1,000 FGE total in box larger than 1.2 x 1.2 x 2.1 m (4 x 4 x 7 ft)

a. Some of these limits are based on WRAP criticality prevention requirements, which are more restrictive than CWC and .BG limits. Higher quantities of fissionable nuclides could be allowed on a case-by-case basis for containers that Will not require reprocessing at WRAP.

b. This limit assumes that the steel drum weighs a minimum of 23 kg *(50.7* lb) excluding the liner. Any drum that weighs less than 23 kg *(50.7* lb) requires overpacking or completion of a criticality safety evaluation.

Source: CPS-D-149-00001, CPS-SW-149-00002, CPS-SW-149-00003, WRPI-CPS-001.

Table B-3. Maximum uranium content of containers with uranium-bearing waste.

Maximum Enrichment (weight percent ^{235}U)[a]	Maximum Total Uranium (kilogram)
0.71	Unlimited
1.00	450
1.15	200
1.25	141
1.50	84
1.70	61
1.80	52
2.00	40
2.50	25
3.00	18
3.50	14
1.0	11
5.0	7.8
8.0	4.0
10.0	2.9
20.0	1.2
30.0	0.75
50.0	0.41
75.0	0.25
Greater than 75.0	0.18

a. Uranium-bearing waste disposed at trenches 31 and 34 in the LLBG cannot exceed 1% enrichment unless it is shown to be in an insoluble or stabilized form. A case-by-case evaluation Will be performed by WMH acceptance organization for non-exempt uranium bearing waste exceeding 1% enrichment for trenches 31 and 34.

Sources: CPS-D-149-00001. CPS-SW-149-00002, CPS-SW-149-00003, WRPI-CPS-001

B-5. REFERENCES

ANS 8.15, "Nuclear Criticality Control of Special Actinide Elements," American Nuclear Society, 1981